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The Advanced Guide to WEBDESIGN

Take your skills to the next level

228 pages of expert advice and step-by-step tutorials

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INSIDE>

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- Pro SEO tips for high rankings
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- Set up your own agency
- Win more clients than ever before

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Subscriptions
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Printed in the UK by William Gibbons & Sons Ltd, Willenhall on behalf of Future.
Distributed in the UK by Seymour Distribution Ltd,
2 East Poultry Avenue, London EC1A 9PT. Tel: 0207 429 4000

Future produces carefully targeted special-interest magazines, websites and events for people who share a passion. We publish more than 170 magazines and websites and 100 international editions of our titles are published across the world.

Future plc is a public company quoted on the London Stock Exchange (symbol: FUTR).

www.futureplc.com

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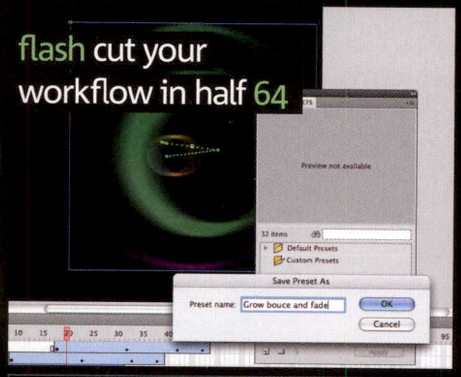
The Advanced Guide to WEB DESIGN

Take your skills to the next level

So you want to become a web design master? You've come to the right place. Over the following pages, we'll provide you with everything you need to know to get ahead of the competition. Section one provides expert insight into the running of a successful web business. Section two is packed with 25 hands-on projects to refine your CSS, Flash, Papervision, jQuery and Ajax skills. You'll also discover the best ways to convert your site to mobile. Section three includes advice on all other aspects of your business: search, analytics, marketing, hosting and security. All of these articles, written by the biggest names in the industry, are drawn from .net, the world's best-selling magazine for web designers and developers. If you like what you've seen, why not take out a subscription? Turn to page 30 to find out how...

Oliver Lindberg, editor
www.twitter.com/oliverlindberg



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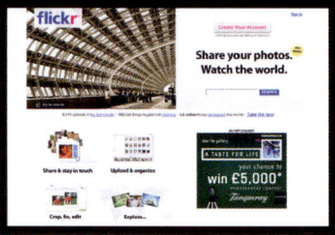

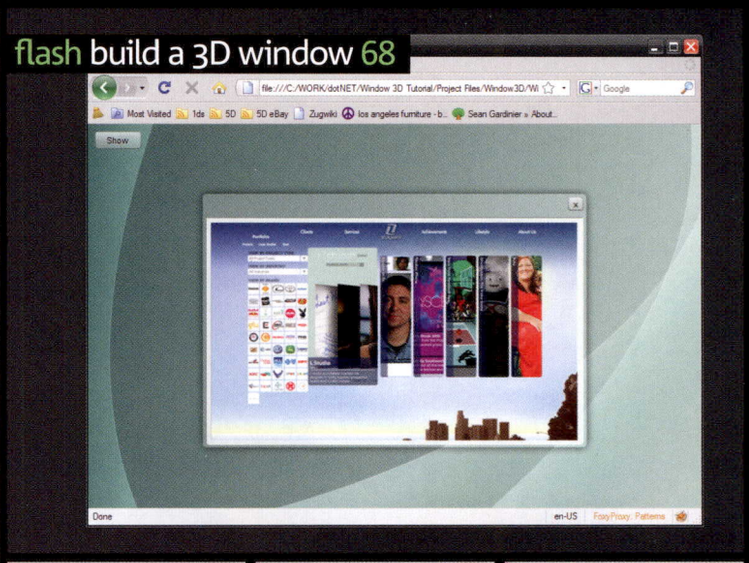

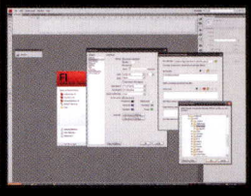

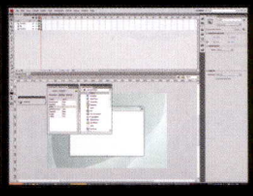

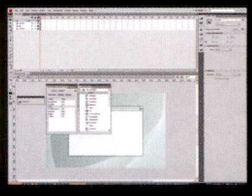

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Start your own agency

Have you dreamed of being your own boss? From tax and business plans to customers and employees, there's a lot to take in, yet it could be the best decision you make, says **Mark Boulton**

Words Mark Boulton
Mark Boulton Design is a small design studio based in Cardiff.
markboulton.co.uk

Image Knight Design Studio
Bristol-based graphic design agency.

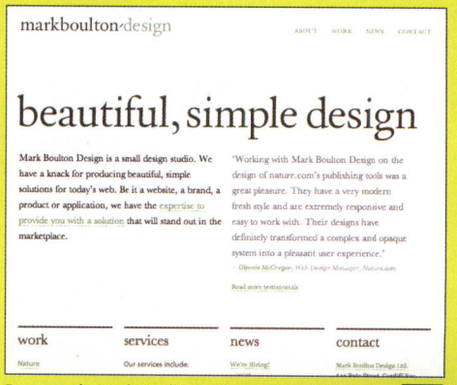
So you want to work for yourself? And why not. You can dictate your own hours, have the freedom to take time off when you want to without getting into trouble with the boss; you can do what you want to do, when you want to do it. At least, that's what I thought when I started working for myself a year ago. I couldn't have been more wrong.

The freedom of being in control is terrifying. The pressure of knowing that it really is down to you whether you succeed or fail can weigh heavy.

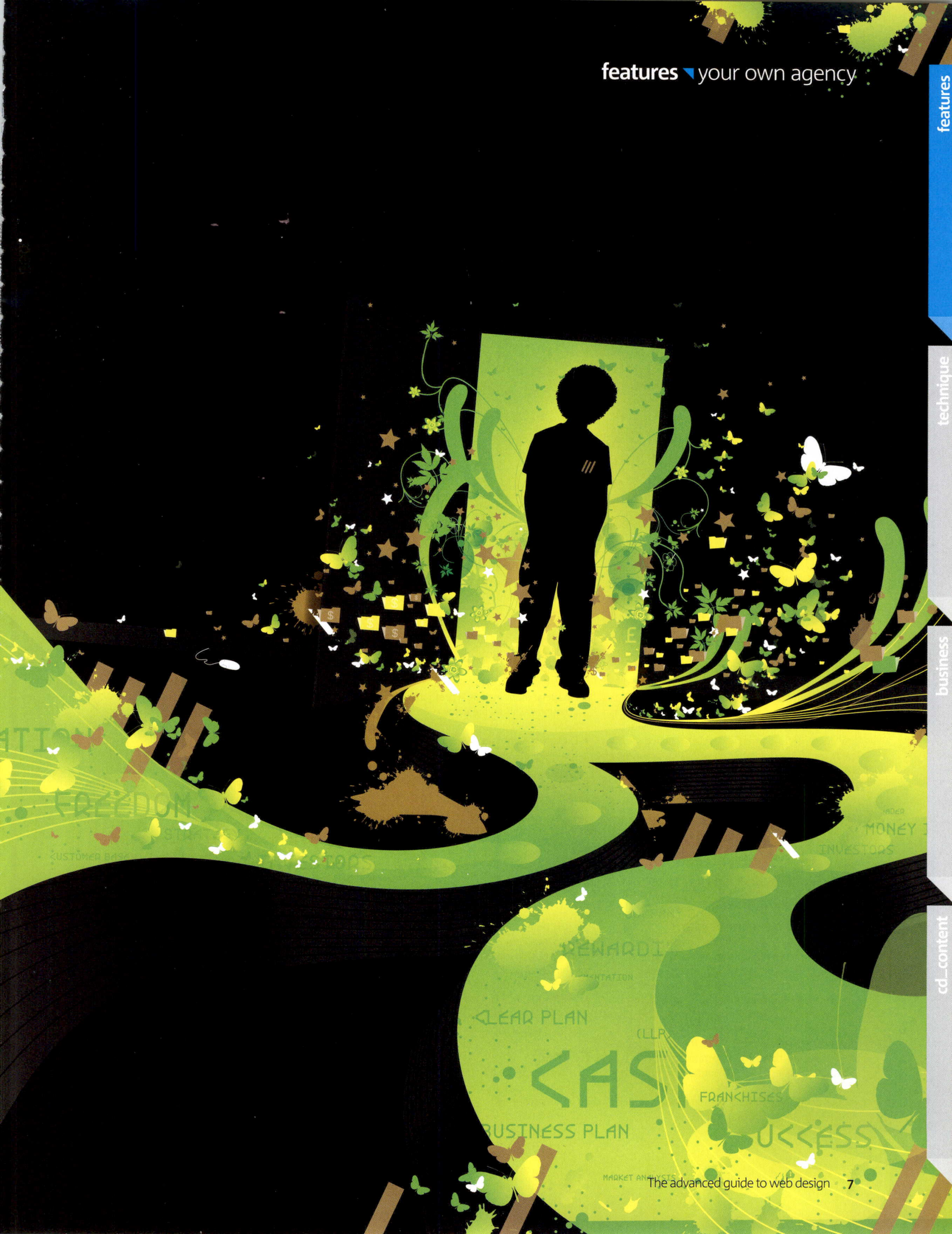
Where I live, in Wales, almost 400 people a week start their own business. Everybody's different and end up giving it a go for a variety of reasons. However, most of these people share common ground – things that they need to think about when planning to go it alone.

I've been my own boss for a few years, and while I wouldn't call myself an expert, I can tell you my story, and the mistakes I made along the way. Starting a business is one of the most challenging, yet rewarding, things you can do. The reason most people never end up doing it (though I'm sure many would love to) is because they think it takes luck, a clever idea or just

I can tell you my story, and the mistakes I made along the way



By example Mark Boulton's blog offers advice on a range of aspects of running a web design business >>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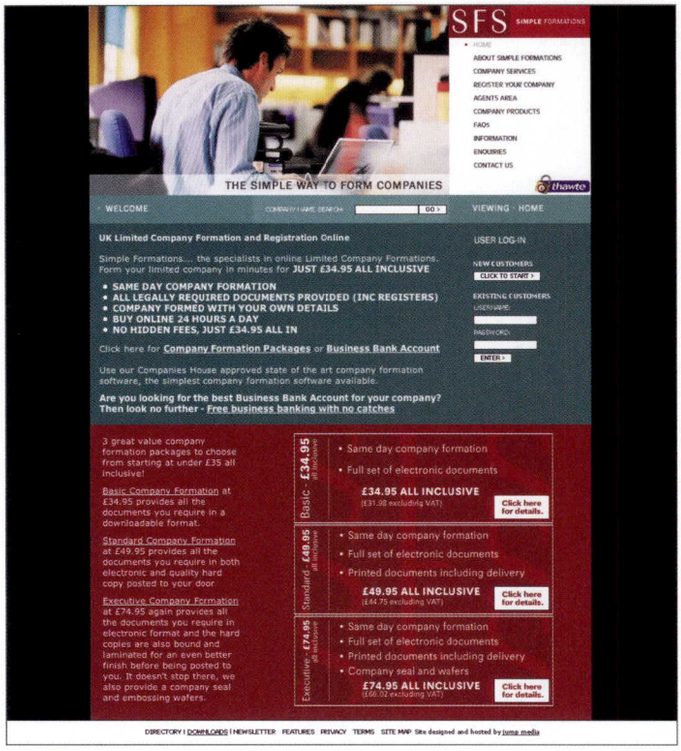

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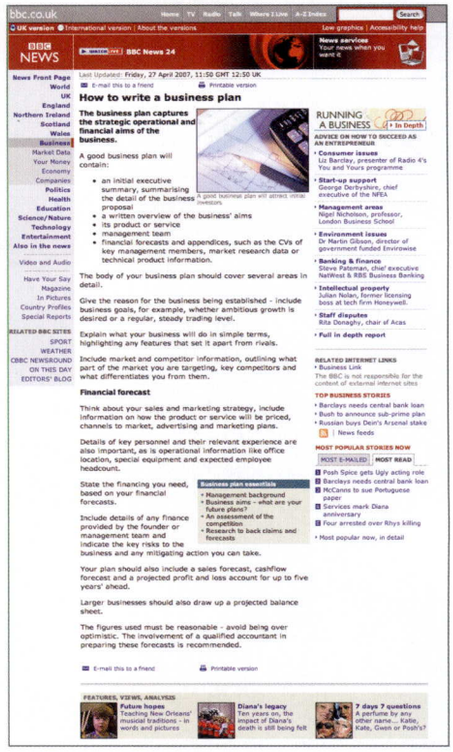

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(1) The Simple Formations site (www.simple formations.com) for info about self-employment
(2) Register with the Inland Revenue (www.hmrc.gov.uk) if you're in the UK
(3) The BBC's take on writing a solid business plan can be found at news.bbc.co.uk/1/hi/business/2943252.stm
(4) Business Links' "Practical advice for business" is an invaluable resource (www.businesslink.gov.uk)

>> knowing the right people. This simply isn't true. It's about you.

Maybe you have a great idea that you just can't keep a secret any more. Maybe a colleague has approached you to set up business with them on the back of a contract they've just secured. Maybe you just hate your job and wish you were your own boss. The catalyst is different for everyone.

For many people, including myself, they've found themselves at a career point where self-employment is the next natural progression. I was working full-time at the BBC as a designer when my enquiries to do freelance work reached such a peak that I was doing two jobs. At that point, one of them had to go before my wife did! Whatever the reason to set up business, it's a personal one that only you can make.

Whatever the reason to set up business, it's a personal one that only you can possibly make

Do I need a business plan?

A business plan is just that: a plan about your business. It's used to look ahead, allocate resources, focus on key points, and prepare for problems and opportunities. It doesn't need to be a scary document that takes months to write. However, some banks, investors, or other funding bodies will insist on a well-written, concise business plan on which to base their decisions, so in that sense, it's a very important document. A standard business plan will contain the following:

1. **Company description:** This details how and when the company was formed.
2. **Product or service:** Describe what you're selling.
3. **Market analysis:** You need to know your market. Establish the need for your product and why people need it.
4. **Strategy and implementation:** Be specific. Investors love this stuff. They need to know that you have a clear plan of attack.
5. **Management team:** Include backgrounds of key members of the team.
6. **Financial Plan:** Include a profit and loss account, cashflow breakdown and a balance sheet.
7. **Executive summary:** Write this last. It's a summary of your document.

Make no mistake, writing a business plan can be a daunting prospect, but it doesn't have to be great the first time around. A business plan should be revised throughout the business' lifetime – it's not just for start-up businesses. I've just gone through my third draft in my first year of business.

As usual, the web has some great resources to offer. The BBC has a good overview of "How to write a business plan" (news.bbc.co.uk/1/hi/business/2943252.stm).

Get help

This is perhaps the most important step in setting up your own business. You will realise you can't do it all on your own. You'll need good advice from the following people: An accountant (preferably a small business specialist), a bank manager (all new businesses should be allocated a small business specialist from their chosen bank), a financial advisor (you'll need the advice of somebody who can assist in the financial direction of the company), and the government. Yes, they can help too! Of all of these, spend the most time trying to find a really good accountant. Many business owners will tell you that a good one is worth their weight in gold. In addition to the usual accounts stuff, they can give you invaluable advice on a number of other things relating to being self-employed.

A great source of business advice for England and Wales is the Business Link website (www.businesslink.gov.uk) Here, you can find information on starting up and funding options, to Health and Safety and employing people.

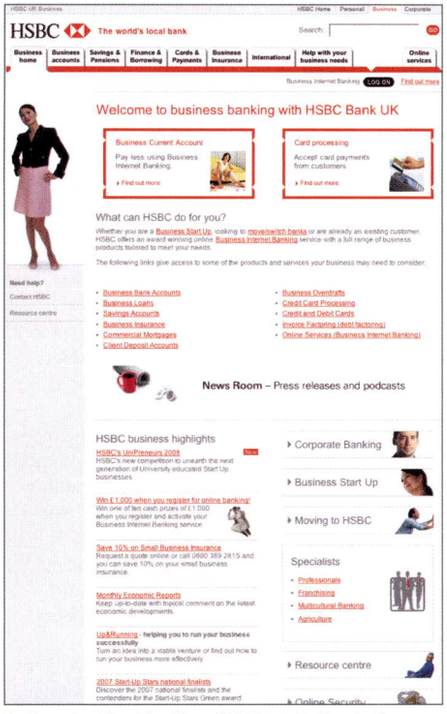
The different kinds of company

To register as self-employed in the UK, you have to register with the Inland Revenue (www.hmrc.gov.uk) as one of several company types:

Sole trader – Being a sole trader is the easiest way to run a business, and doesn't involve paying any registration fees. The downsides are that you're personally liable for any debts that your business incurs and, if you do well, you could be paying high income tax.

A partnership – A partnership is like two or more sole traders working together. You share the profits, but also the debt.

A limited liability partnership (LLP) – An LLP is similar to a partnership. The only difference is that the liability, or debt for example, is limited to investment in the company.



Business banking The likes of HSBC et al offer sterling business advice (www.hsbc.co.uk/1/2/business)

A limited liability company – Limited companies are separate legal entities. This means that the company's finances are separate from the personal finances of their owners.

Franchises – A franchise is like a licence to an existing successful business.

Social enterprises – This one probably doesn't apply to web development. According to Business Link, social enterprises are "businesses distinguished by their social aims. There are many different types of social enterprises, including community development trusts, housing associations, worker-owned cooperatives and leisure centres."

How to finance yourself

Before I made the leap into full-time self-employment, I read a lot of articles that said I would need six months' salary in the bank before I went out on my own. Although that's essentially good advice, depending on your salary, that's quite a hefty chunk of cash and it may be particularly difficult to save.

Like most people, I didn't have that sort of money knocking about, so I had to sit down and take a close look at my cashflow situation over the first few months of business to ensure that I could pay myself. This cash eventually came from several sources:

1. **Money in the bank.** I did actually have some money in the bank. Not a huge amount, but I had some!

2. **Contracts.** I had a number of contracts signed and ready to go when I went on my own. These proved invaluable in kick-starting my cashflow.

3. **Funding.** There are many funding options available. Grants, loans and private investment. All of them except grants require you to pay them back, though, and for that you need a good business plan and an idea of how you're going to pay them back. Grants (and small business loans) are available from local government bodies, for example. I advise making an appointment with your local Business Link to discuss your options.

4. **The Bank.** Get an overdraft facility. Mostly, even for limited companies, these will have to be personally guaranteed, which means if you default on paying it back, then you're personally liable. But they can provide a vital buffer for cashflow in those early days.

5. **Charge upfront.** When you get a contract in, especially if it's for fixed cost, then charge a percentage upfront. This will help with the cashflow. If you can't charge upfront, then make sure you charge monthly. Again, it will keep the cashflow nice and happy.

10 things I wish I'd known

Wearing many hats

Before I set up business, I'd read a few "how to" books and a number of blogs that talked about the many roles you would have to adopt while running your new business. I still struggle with it. On a typical day, I'm a designer, a project manager, a salesman and a bookkeeper. Each role requires a different mindset and it can be very difficult to switch between them.

Home is for home things

Keep work and home separate. When you work at home, this can be difficult. When I had my workplace in my house, I made sure it was a completely different room which was furnished like an office (not just a spare room with a desk). Wear your shoes during the day, when you're working, and at night, take them off. It's a silly little thing, but you will soon associate shoes with work. So, when you take them off, that's home time.

What goes around comes around

Be nice to people. Business doesn't have to be unpleasant. Treat people how you expect to be treated. Be fair, professional and, above all, polite.

Don't take on too much

This one is a killer. I still do it and probably will for many years to come. When you don't have any work booked in in three months' time, the tendency is to get more work in now with the hope that, financially, you'll be more stable in the months you don't have work. It makes sense, but you end up working too hard. As a result, quality dips, customers get a bad service and, over time, your business will dry up.

Hire somebody before you need to

I've recently had this problem. I was so busy that I needed help. After hiring someone, I realised I'd been in this position for too long. I needed help about three months before I thought I did.

Don't under-charge

Work out your costs on an hourly, or daily, basis and then add 30 per cent. It covers costs and, until you get the hang of it, you're probably under-charging anyway.

Confidence

Remember, you're the expert. You're not doing this job because you're average at it. If a customer wants to buy your product, or hire you, it's because you're good at what you do.

Customer service

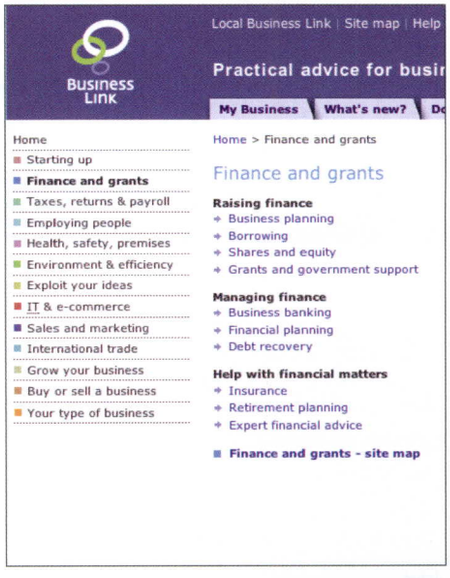
If you're a web designer or developer, unless you're producing and selling a product, you will be providing a service. With a service comes Customer Service and, yes, customers are always right.

Accounting software

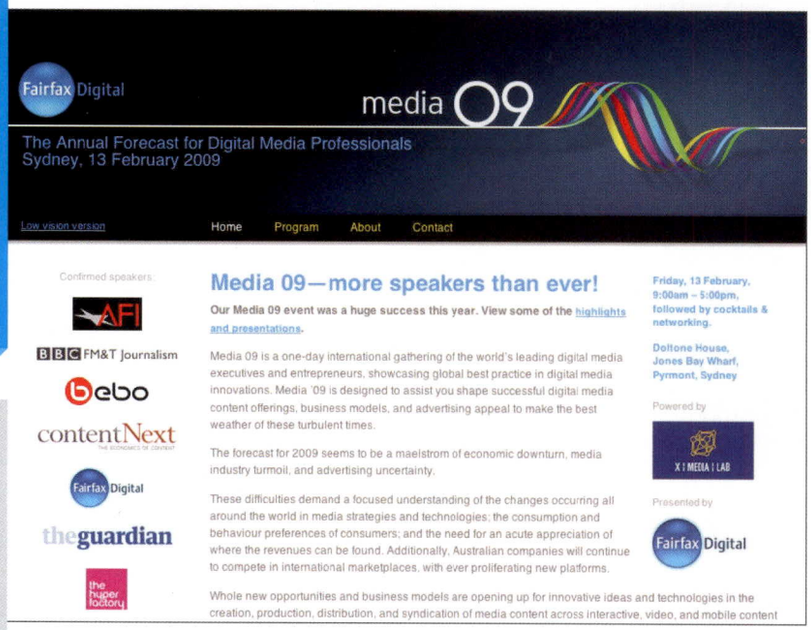
I was using a homemade system coupled with an Excel spreadsheet for my accounting. As the business grew, I needed something robust. I wish I'd learned Sage or something sooner, because now I don't really have the time.

Plan for tomorrow

I have three to-do lists. A month list, a three-month and a six-month. Each list has a bunch of things I need to do for that time period. This enables me to have short-, mid- and long-term goals. I class six months as long-term in this industry!



In the money Business Link also offers a service for helping you find financing for your new venture >>



Left Events such as @media provide opportunities to network with those who may find your services invaluable

Above The Telegraph Business Club (telegraph businessclub.co.uk) offers great networking events

Basic accounting

Cashflow is the lifeblood of your new company. It's the ebb and flow of cash coming in and going out. The aim is to have a positive cashflow, so there's more cash coming in than going out once you deduct your overheads.

You'll also need to forecast your cashflow. This is still one of the most sobering things I have to do regularly, because it clearly shows the current state of your business. Every month, I review my cashflow and I forecast for three months, and for six. I make a list of all the invoices that need to be sent in those two time periods, and I make sure I'm hitting my monthly and quarterly cashflow targets. It can be scary at times!

When it comes to tax, there are two types: income tax and corporation tax. For sole traders, partnerships and LLPs, you will be charged income tax on your profits. That's important, so I'll say it again. You'll only be taxed on your profits. Things such as equipment costs, rent, phone and other office expenses are deducted from this.

Limited companies are charged corporation tax on their profits. The employees of that company are charged income tax on their income. As with a sole trader etc., limited companies are only taxed on their profits.

If your business earns £64,000 or more in a financial year, you have to register for VAT. If you think you may hit this target during the year, you can voluntarily register beforehand.

Being VAT-registered means you have to charge your customers for VAT on top of your services. Currently, in the UK, VAT is 17.5 per cent. You are, in effect, collecting taxes for your government. One of the advantages of being VAT-registered is that you can claim VAT back off purchases for your business. Say you bought a new computer, you could claim the VAT back from that purchase. All this VAT gets added up and you have to pay the government every quarter-year.

For more information of your obligations as a business to pay your taxes, go to the Inland Revenue website (www.hmrc.gov.uk). There are some great tools on the website to help you, and you can even file your tax return online.

Giving a little quality content away for nothing may make the difference in landing that next big project

Establishing a customer base

Prior to starting my own business, I worked full-time. As a designer or developer, you will probably get enquiries to do freelance work in your spare time. This is the time to start building up your customer base, while you still have the security of a full-time job. Sure, it means burning the candle at both ends, but it does ensure a smoother transition from employed to self-employed.

A good way to drum up business is to network. This can be done traditionally, such as Business Club lunches and events organised by your local authority. One of the most effective ways of getting your face known is by attending the many web conferences, workshops and meet-ups going on throughout the country. From Pub Standards (www.pubstandards.co.uk) and the Oxford Geek Nights (oxford.geeknights.net) to the larger conferences such as @Media (www.vivabit.com/atmedia2009/) and dConstruct (2009.dconstruct.org/), they all provide a platform to meet people who may require your services.

If you're a design studio who designs websites yet has a strong focus on user experience design, then write a company blog about that subject. If you write interesting content and give it away for free, then traffic to the site will increase (as will your page rank in Google). This means that if a potential client searches for "user experience", they will see your site in their search results, and there's a clear path into your website for some quality content. Giving a little quality content away for nothing may make the difference in landing that next big project.

Making the switch

If you're employed, but planning to go freelance, then keep your day job for a while. Get work in to do in your spare time, but use the cash that it generates as a buffer for when you do go it alone. Make sure the two worlds don't collide, though. Keep your boss happy in work, but now is the time to be a bit of a jobsworth. Get in on time, leave on time, take an hour for lunch – do everything you can to maximise the time you have available to work on those freelance projects.

Working two jobs is hard (and you'll need to check that you're not in breach of your contract by doing so). This stage in starting up your business is one of the most difficult. The aim is to ensure a smooth transition from being employed to self-employed. You'll need some cash in the bank, and

Timeline/ Six months to making the plunge...

6 MONTHS TO GO

Start building a customer base. Trawl the freelance websites and get yourself a few freelance gigs. Register your business with the Inland Revenue. I'm afraid that, for the next six months, you'll be working two jobs. If you can get funding for your venture, start researching what you can get and when.

5 MONTHS TO GO

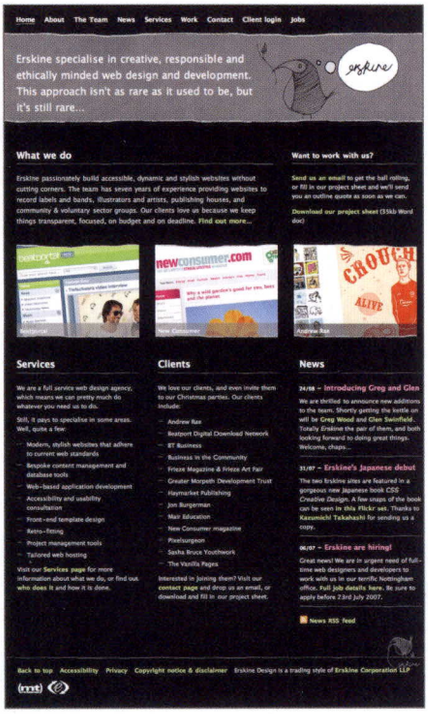
Continue to get those freelance gigs in. Begin to research a good local accountant. Book an appointment with several banks – you'll need to get a business bank account – but it's worth shopping around. Have regular meetings to discuss further funding opportunities.

4 MONTHS TO GO

Found a good accountant? Have a meeting to chat about your new venture. Finalise your bank account with your chosen bank. Continue to build up your customer base. Speak with local companies to see if they need freelance help. Are you working from home? If not, start looking for a base to work from.

Interview Simon Collison – Erskine Design's founder on being your own boss

Name Simon Collison
Site erskinedesign.com
Company Erskine Design
Job title Partner/founder



The graft Hard work and the ability to make sensible decisions can pay off, as in the case of Erskine Design

.net: Why did you end up working for yourself after happily working in an agency?
SC: After four successful years with another agency, I did start to dream about being in control. I'd sometimes receive offers to work for other people, but nothing ever grabbed me. I'd get a few people emailing me every week with requests for websites, and I grew in confidence, realising that I could actually earn enough money to survive. I just wanted to nitpick clients and decide who to work with.

.net: What do you love about working for yourself now?
SC: The autonomy. I love making my own decisions and being in control of the direction we're heading, the clients we choose to work with, and being able to hand-pick colleagues!

.net: What don't you like about it?
SC: Lots. The hours (over 100 hours last week). It can take over your life if you want to produce quality work with no corner-cutting. Sacrifices are inevitable – everything from working the majority of evenings and weekends to missing your best friend's birthday. If there's an immoveable deadline and the work needs doing, the buck stops with you.

.net: If there were three pieces of advice you could give to someone going into business for themselves, what would they be?
SC: Just three? OK. One: Achieve a work/life balance and stick to it as best you can. Ultimately though, except for crisis stuff, you'll end up putting work first, so be prepared for that. Two: Trust yourself. You'll make mistakes, but generally the decision to work for yourself won't be one of them. Have the courage of your own convictions and just go for it! You will know when you're ready and have enough work or contacts to ensure you break even and can pay yourself. Three: Realise that you're not an expert at everything, so get people to help you. Get business advice, get to know your bank manager, and use an accountant. When you're seriously busy, the last thing you'll want to be doing is invoicing, or doing anything at all in Excel.

.net: What's the biggest mistake you've made since you started up?
SC: Under-charging in the first few months. The temptation from day one is to bring the work in and build up a client list. This kind of thing will not wreck your business, as you'll simply put the extra hours in, but it's seriously detrimental to your health and lifestyle, and even the quality of the work you produce.

.net: Where do you see your business in two years' time?
SC: Thriving – you gotta be confident, right? We're lucky in that word of mouth and recommendations bring the work to us. We don't take this for granted and never will, but the hard work in our first year is paying off, and we now have a solid foundation to build on. I never dreamed there would be five of us within a year, and we hope to grow to about 10 soldiers in the next 24 months. When you work this hard, you have to remember to be proud and enjoy what you do.

a few contracts for the first couple of months of being on your own. The hard thing is keeping your current boss happy in the process.

There are a number of great job boards which advertise design and development projects regularly. The two I've used successfully in the past to drum up some business are the 37Signals Job Board (jobs.37signals.com) and Cameron Moll's Authentic Jobs (authenticjobs.com).

Achieving long-term success

Forecasting business can be difficult. How does cashflow look in three months' time? Are you saving enough money for the end-of-year tax bill? To succeed in business, you need one eye on the present and one eye fixed firmly in the short-term future. While it's great to have aspirations for your new business, they shouldn't be at the expense of ensuring you have enough work coming in over the next six months.

If you're a designer or developer, you're providing a service. We're in a service industry and with that comes Customer Service. I know it may sound trite, but treat clients as you would like to be treated. Treat them with respect and never lose sight of that fact that they're paying the bills.

Making a leap of faith is the first step to starting a business. However, for your business to grow and flourish, you will need much more than faith alone. First, you must have utmost confidence in your ability to make it work. You need to be aware of the risks, yet not scared to death by them. You'll need to have good organisational skills, flexibility and a high degree of commitment. Most of all, you need to have fun and love what you do. Best of luck! ●

WWW. *Are you thinking of starting your own business? Share your thoughts at forum.netmag.co.uk*

3 MONTHS TO GO

Cash considerations. You should be getting some money in from your freelance gigs by now. Save it – you may need it in a few months.

2 MONTHS TO GO

You should be working like a dog now and really looking forward to working for yourself. At this stage, everything should pretty much be in place for you to make that smooth transition from employed to self-employed.

1 MONTH TO GO

Hand in your resignation. If possible, try to get some work booked in for the first three months of being on your own. Make sure you also get paid by these clients monthly, so that regular cashflow doesn't become an issue.

Making the perfect pitch

There's never been a better time to refine your approach to winning new clients. **Richard Rutter**, co-founder of Clearleft (clearleft.com) examines the pitch process from start to finish and reveals how you can beat rivals and win every contract

Words Richard Rutter is a founder of usability and accessibility consultancy Clearleft. He's been designing websites and web apps for over 12 years. clearleft.com

Image Knight Design Studio Bristol-based graphic design agency.

For many agencies, pitching is seen as a necessary evil, that painful, time-consuming process required before the 'real work' can start. But agencies and their staff shouldn't be scared of pitches.

With the right approach, pitching can be a fascinating and rewarding process, and not just from a financial perspective. I spoke to some leading design agencies and combined their thoughts with our experiences at Clearleft to guide you through the pitching process.

The RFP

The process normally begins by receiving a Request for Proposal (RFP) from a potential client. The RFP is a project brief, which asks for a proposal document in return. The client selects which agencies it wants to see based on these proposals, so clearly they're important documents to get right.

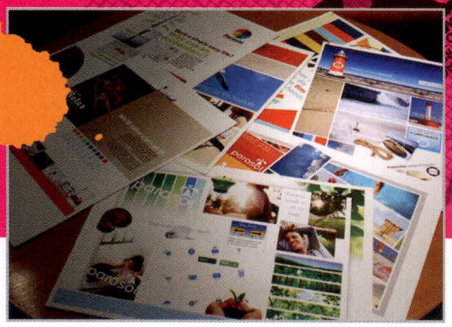
Often the quality of a proposal will be proportional to the quality of the RFP. On that premise, rather than being the trigger to writing documentation, an RFP should be viewed as the first opportunity to talk to your prospective client.

Finn Taylor, co-founder of Liquid Light (liquidlight.co.uk), an award-winning web design agency based in Brighton, says he will always try to meet a client before writing a proposal.

"I want to have a good informal discussion about their business and let them talk about what they're doing," he explains. "That way, when my proposal document arrives, it's tailored around thinking about their issues. >>

Boost your web career >
Use social media to raise your profile – see page 174

Get clients on side...Want to win...
HOME
AWAY
WINS 29
STRUCTURING YOUR PITCH
DESIGNING DOSSIER
FOLLOW UP
DO YOUR RESEARCH



Above/right Moodboards can help when pitching a website concept to the kind of non-techie client who runs scared at the first sign of a site map

With an informal discussion, you get to pull apart and challenge the expectations of what they want. This often means that you find a whole bunch of issues they haven't considered, and you end up reinventing their brief based on that discussion. Ultimately you get a much more insightful document that raises solutions to their problems."

Liquid Light co-founder Rob Day goes on to say that this first meeting reduces to 50/50 the need for a formal pitch. "Everything they need to know about you they get from that first meeting." he explains. "If they've had good face-to-face interaction, then they'll think they can work with that person. It generally seals the deal."

Warning signs

But before you go trekking across the countryside to see a prospective client, you need to find out a few key facts. Primarily you need to ascertain if the pitch is actually real. Sometimes agencies are invited simply to make up numbers, so it's important to work out if the decision has already been made. See if the contact will engage you in a conversation about the project. If not, that might be a warning sign, both for the reality of the pitch and your future relationship.

Next, you need to cover the two fundamentals of delivering projects: timescale and budget. Sometimes the timescales that clients set are arbitrary and unrealistic. If this is the case, explain how long projects usually take to do properly, and their deadline may change. If, however, the deadline is set in stone you need to be sure you can meet it. Busting deadlines will only lead to stressed staff, an unhappy client and no chance of repeat business or referral.

Discussing budgets at such an early stage can be a touchy subject, but you need to know. There's little point working on projects that won't make any money. If the client won't tell you the budget directly, explain the kind of services you're likely to provide and suggest a ballpark range. If they dismiss you out of hand, you've just saved yourself a whole lot of work and an unnecessary trip. Otherwise, it's time to get down to work.

Do your research

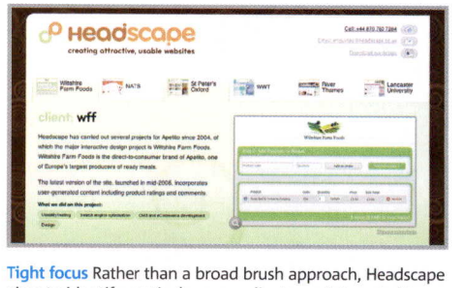
If you're going to spend time writing proposals and pitching, you need to know what you're talking about. This takes time, and preparation counts for everything. So if you're going to take the plunge do it properly, or you might just be wasting your time.

You need to have a sound understanding of the client's business objectives. You need to know what they're looking to achieve, and what they want the user to do.

They may be hoping to sell a product or service. But how? What message are they trying to sell to the public? Who are they reaching out to?

Read their website, learn their message and discuss it with your colleagues. Research the client's competitors. And talk to the client – ask them those questions directly.

You need to gather enough information and insight in order to develop a strategy and design



Tight focus Rather than a broad brush approach, Headscape aims to identify particular areas clients are interested in

First impressions What not to wear

Think about what you wear to a pitch. Do you want to be seen as the 'stiff in the suit' or the 'scruffy art student'? The chances are that neither character would win the pitch.

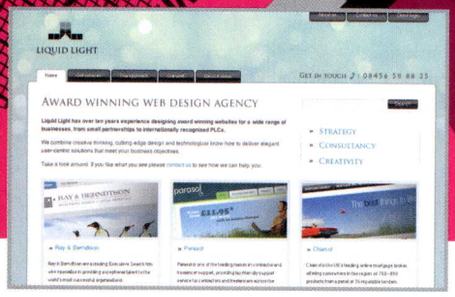
Remember that you don't always have to be attired in the same manner as the people you're meeting. Pitches are not job interviews. It might be that a company of suits actually wants to meet casually dressed creatives. As with everything in your job, it's about knowing your audience.

You can't turn up scruffy. Clients will expect you to be professional and to show courtesy and respect. But you're not trying to be slick or outsmart them, you're trying to show a bit of flair and style.

I once turned up to a pitch in a suit with my colleagues and the company could see we weren't a suit agency. We lost the pitch. The ultimate decision makers must have said: "If these guys didn't have the confidence to come as themselves, how can we have the confidence in them?" And they were absolutely right. We were trying to present ourselves as something we weren't, and that's wrong.

You're in the business of making a first impression. A website site lives or dies in the first few seconds, so if that's what you're trying to sell to a client, you've got to achieve that in the real world as well.

Dress for success Think about what you wear. Whether it's T-shirt or a suit, show respect but be true to yourself and your sense of style



Be prepared Brighton-based agency Liquid Light will always try to meet a client before writing a proposal

that will meet and exceed the client's expectations. How much time should you spend researching? According to Marcus Lillington, from Headscape (headscape.co.uk) and the Boagworld podcast (boagworld.com), "it depends on the potential size of project, the perceived chance of winning, and how much emphasis is placed on 'creative' thinking as part of the brief. Most potential clients will base their selection on how much effort you've put in and, of course, the quality of your ideas."

Structuring your pitch

One of the most useful pieces of research you can do is to find out who's going to be in the meeting. That will guide the kind of pitch you'll be able to give.

If it's going to be 12 people, you're going to have to do more of a formal presentation. If it's a three-person meeting, you'll be able to have much more of a discussion.

Either way, try to clarify what format the client is expecting. Often clients are happy to leave the agenda up to you, but occasionally they'll demand a formal presentation, so make sure you know that in advance.

"If the original brief didn't spell out what's expected of you at a presentation, then make sure you ask beforehand," says Paul Boag from Headscape. "The critical element is how much time you have. It seems that panels are providing less and less time these days. Ask if there are any areas that they particularly want you to cover and if there are any areas of your proposal that were weak. The usual formula is that you get an hour. Half of this should be a presentation of your ideas, followed by 30 minutes of questions. This isn't that much time, particularly for a big project, so a formal, slide-based presentation can be a useful way of structuring your thoughts."

Engage your audience

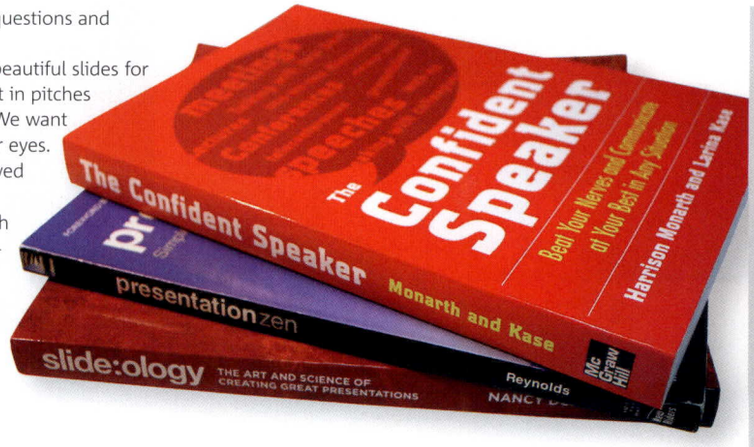
"Remember, though, that the people you're meeting might have been sitting there for two days, seeing five agencies each give hour-long formal presentations," Boag cautions. "By the time you walk in, their brains may already have shut down. You'll need to wake them up, and a dull ream of bullet points isn't going to achieve that." Make sure your slides serve a purpose and engage the client as you go through them. "We use Keynote slides in our pitches," Lillington says, "but we always encourage questions and tangents along the way."

> "We always encourage questions and tangents along the way" Marcus Lillington

At Clearleft, we love creating beautiful slides for our conference presentations, but in pitches we prefer a rigorous discussion. We want the client to see the whites of our eyes. We really want to get them involved and enjoy themselves.

Liquid Light takes this approach too. "If you can have a round-the-table discussion then really it's a dating game," says Taylor. "You've just got to get each person on side. Work the room one by one, making sure each person's key issue is dealt with. If it's the right chemistry, you'll feel good, they'll feel good and that's when you'll win the project."

The more formal approach doesn't preclude working on the chemistry, either. In Headscape's pitches, says Lillington, "we'll make a certain point that changes the whole vibe of the pitch.

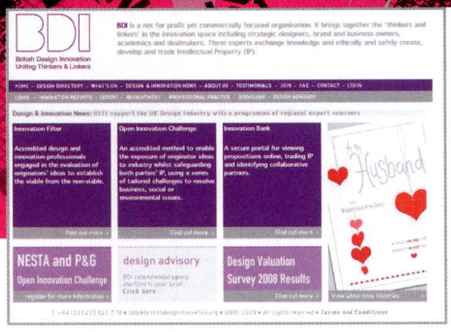


Right Confidence is key – if you're lacking it, there's plenty of literature to help you overcome your nerves

Top 10 tips Winning pitches made easy

1. Find out if the pitch is real. Sometimes agencies are invited simply to make up numbers, so it's important to work out if the client's decision has already been made.
2. Uncover the two fundamentals of delivering projects: timescale and budget. If necessary, explain how long projects usually take, and help adjust the client's deadline appropriately. If the client won't tell you the budget directly, explain the kind of services you're likely to provide and suggest a ballpark range. If you won't be able to deliver on time or to budget, don't spend time pitching.
3. Do your research. You need to have a sound understanding of the client's business objectives and what problems they're trying to solve. You need to gather enough information and insight in order to develop a strategy and design.
4. Build up a relationship beforehand. Talk to the client before writing your proposal or turning up at the pitch. Try to get someone on your side by discussing the project and listening to what they have to say.
5. Go into the pitch positively, wanting the job and wanting to show you're the best. It's easier said than done, but don't come across as nervous. It's an especially bad signal to send as it indicates that you are either dishonest or inexperienced.
6. Think about what you wear. Clients will expect you to be professional, and to show some courtesy and respect. But remember that you're still a creative agency, so be true to who you are.
7. A client may well need to sit through four or five pitches in one day, so bringing your recommendations to life is key. Encourage questions throughout, and ask if you are making sense. This can encourage questions if you're not getting any wider client base.
8. Read your audience. If a point you raise causes two people to nod at each other, follow up on that point: don't just keep grinding through your keynote presentation.
9. Create a rapport with the client. Ninety-nine times out of a hundred, they won't hire you if they don't think they can work with you, so work the room one by one to get each person on side. Aim to be helpful, listen and ask questions. Be enthusiastic, likeable and interested. It's all about having empathy with the client's requirements/problems, wowing them and getting them to trust you.
10. Remember that clients are people with the same emotional needs as the rest of us. Persuade them that you're going to make them – the individuals in that room – look good and that you're going to add that little bit of magic.

Right: The most important factor is rapport, says Marcus Lillington
Far right: British Design Innovation (BDI) strongly advises its members never to design on spec



How many people do you take?

The general consensus for how many people should attend a pitch meeting is either one or two. Quite often one is enough. If the project is large and wide-ranging, then sometimes it's just not possible for one person to have all the answers. But any more than two people might seem like you're turning up mob-handed and could be somewhat intimidating for a client.

"I've done many pitches on my own," reveals Marcus Lillington of Headscape. "But usually we take two people. Occasionally, we're asked to wheel out 'the team' but even then, this rarely means more than three."

If two of you are giving the pitch, think about how you'll work together. Going for a good cop/bad cop routine may not quite hit the mark, but definitely work out the dynamic between you.

Ensure that you'll both be contributing on an equal basis. One possible approach is for each of you to specialise in one particular area, answering questions and addressing concerns as your specialist subject arises in the conversation.

"Generally speaking, I think two is the ideal number," says Paul Boag from Headscape. "Although I've presented on my own, I always feel that having someone to bounce ideas off, and have a bit of banter with, works well.

"After all," he points out, "you're not only trying to sell your ideas and expertise, but also yourselves. One of the main things in the panel's minds will be 'Can I work with these people?' Having more than two people at a presentation often looks like you're wheeling people out just to demonstrate that they exist."

Too many cooks You may have an amazing team, but that doesn't mean you should bring them all

>> Clients often place a lot of emphasis on a particular area that they're interested in and if you make a big point out of it before they ask – bingo!"

Formal presentations can feel like a safer option than the conversational approach. With discussions you may have to wing it a bit and you're bound to encounter some tricky questions. But don't feel afraid to say "I don't know". Bluffing will only get you so far. Just promise to follow up with more information and make sure that you do so as quickly as possible. Occasionally you may be thrown a deliberately nasty question aimed at the heart of your company. In this case, focus on your track record, throw around a few big names, emphasise your processes and stick to your guns.

What to talk about

Whether you're putting all your points into fancy slides or jotting them down as discussion points in a Moleskine, you're there to convince your potential client how good you are, and that you're the right agency for the job.

Have a story to tell about the kind of services you offer and the business benefits they provide. You need to stand out from other companies pitching, so don't be shy about sharing your story, although you shouldn't make it the focus of the meeting. You need to spend the majority of your time talking about the client, not you.

Set the scene

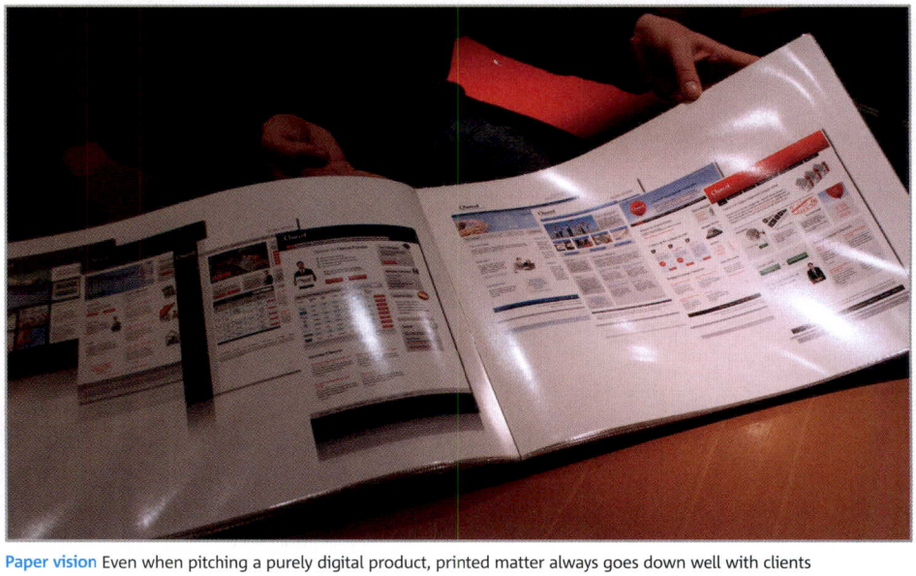
If you're pitching with a discussion rather than slides, it's usually worth setting the scene first. Explain that, while the client might be expecting a presentation, they're smart enough to have shortlisted companies they know can deliver. Point out that what they really want to know is which company they want to work with – which agency is going to understand them and come up with the best solutions. Quickly outline your company (just cover the basic make-up in about five minutes) and then start discussing the client's project.

Clients need to know that you're design competent, technically competent, can deliver on time and to budget, and have project management systems in place. They want a sense of safety and security, but they should have got this from your proposal document. What they need to know from the pitch is that you understand their goals, and that you know how you can fix their problems. They need to be assured that you'll listen to their issues and, most importantly, that they can work with you on a personal level.

> "Most potential clients base their selection on how much effort you've put in" Paul Boag

"Assuming you have tangible evidence that you're good at what you do, I believe the most important factor in winning pitches is creating rapport with the client," says Lillington. "Ninety-nine times out of a hundred, they won't hire you if they don't think they can work with you or they simply don't like you."

Go to the meeting knowing how much you don't know. Arrive curious, and armed with questions. Maintain eye contact and keep your ears



Paper vision Even when pitching a purely digital product, printed matter always goes down well with clients

Above When everything goes well, make sure your team knows they're appreciated. Right Liquid Light prefers the conversational approach to making a formal presentation

open. "If you pay attention and think on your feet," says Paul, "it tells the potential client that they can expect you to listen and be flexible."

You're aiming for the client to walk out of the room and say it was one of the most useful meetings they've had in years. You want them thinking: if that's what you can do in the first hour, what are you going to do in the first three months?

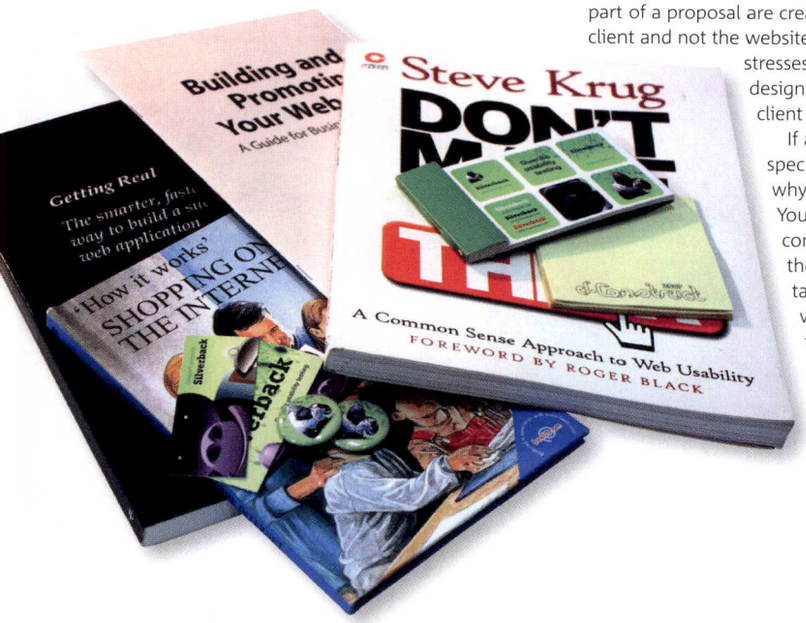
Designing on spec

No discussion of pitching for work would be complete without mentioning the thorny subject of speculative designs. For clients, the prospect of getting a hatful of free 'ideas' before signing a contract seems like a great plan. It's how things worked in the advertising industry for years, but in web design, we're not selling creative imagery – we're selling a process.

Nearly all design organisations, including British Design Innovation (BDI), the American Institute of Graphic Arts (AIGA) and the Chartered Society of Designers (CSD), strongly advise their members never to design on spec, and most professional web agencies heed that advice. As Taylor says: "It's truly bad for the project. Designing on spec is very hit and miss – they just might not like the colour yellow. Worse still, if they do like the design, then you're stuck with it, even if it's wrong. You can't do the design process and you can't charge for it. Clients are not buying a design, they are buying a process to get to the right design. It's the process that gets you something you're happy with."

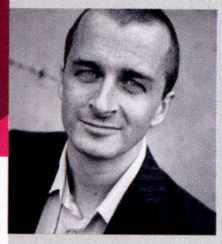
Lillington agrees. "Any designs included as part of a proposal are created to impress the client and not the website's target audience," he stresses. "Producing good web design is a partnership between client and agency."

If a client does ask for speculative designs, explain why it's not a good idea. You'll often be able to convince them. Explain that the design process is about taking a wide cast of viewpoints and bringing that together into a single thread through an iterative process. Once you know the result of the pitch, and particularly if you didn't get the job, always follow up and ask for feedback from the client. It's incredibly disappointing when you lose a pitch, especially when you've put your all into it, but you must learn from the process each time.



Left Forget trying to be flash: a good pitch should above all focus on usability

Case study On the other side of the table



Mark Boulton (markboultondesign.com) is in the enviable position of having worked on both sides of the table. As a senior designer for the BBC, Mark was involved in commissioning outside agencies to do design work. Now that he runs a successful design company, that experience helps greatly when it comes to making pitches.

"In particular, I know on which criteria agencies are judged," he explains. "When I was commissioning, the first thing I'd try to determine would be the ability of the agency to complete the project. Specifically, I'd want to know which project management and processes were in place. I'd want to know that once the project was in progress I'd be able to speak directly to the designer who's doing the work. This actually comes up a lot. Clients are looking for reassurance and a guiding hand through the process.

"Like most clients, I'd do my homework. I'd look into the past experience of the agency. This would include researching on their site, and elsewhere on the web, and also talking to their previous clients. Don't be surprised if clients ring around for opinions on you and your work.

"Unsurprisingly, I'd want to know the cost. I'd ask the agency about their pricing model and where there is opportunity for negotiation. Transparency of budget helps both agency and client here.

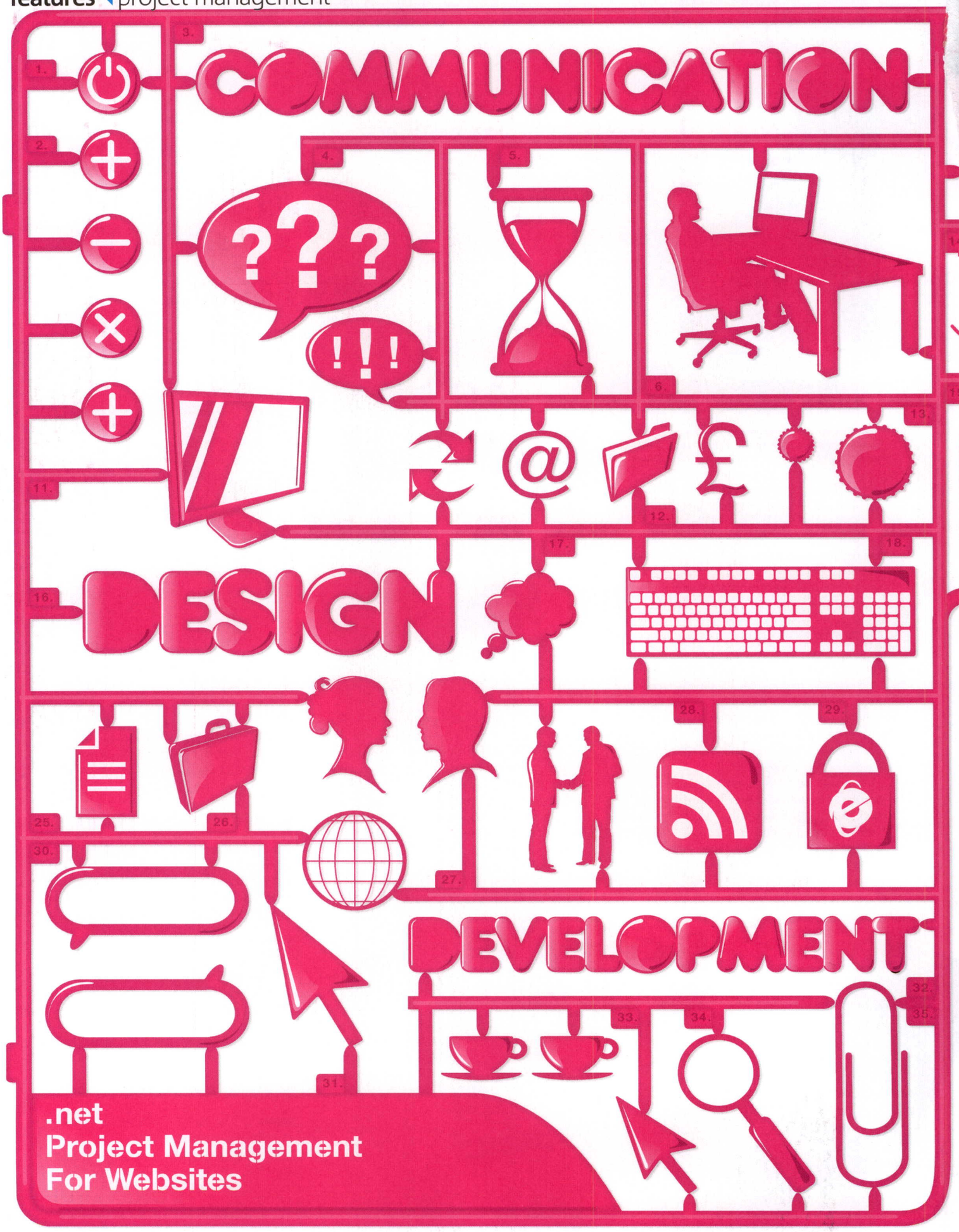
"Overall, I'd try to get a sense of whether the agency is appropriate, not only to the project but to the organisation as well. I needed to make sure they'd be a good fit."

The right chemistry

In the end, winning pitches is about researching the client and who you'll be meeting; talking to the client early in the process; working out their problems and finding solutions; being friendly and helpful; and, of course, listening.

But ultimately it comes down to that intangible something called chemistry and occasionally a bit of good fortune. So good luck, and look forward to your next pitch! ●

WWW. *Do you find the pitching process a breeze or a total nightmare? Share your experiences at forum.netmag.co.uk.*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Perfect your project management skills

Effective project management can be the difference between pleasing and losing clients. **Keith Robinson**, founder of Blue Flavor, explains how to get it right

Project management, in any form, can be a bit daunting, especially if it's not part of your daily responsibilities. When it comes to designing and building websites, formal project management might seem like a luxury you and your team can't afford.

However, while you can complete a website without a dedicated project manager, you do need project management. Taking the time to master some very simple techniques and then using them in your projects can make your life, as well as the lives of your co-workers and clients, much easier. It's not as hard as you might think; just about anyone can manage projects. All it takes is a bit of effort and a willingness to work.

In this article, I'm going to talk about some common problems that cause website projects to get bogged down and, in the worst cases, grind to a halt. I'll be revealing the secrets of running a successful project plus the basics of project management, as well as going into a bit of detail about what makes a good project manager and the skills you'll require to ensure success, regardless of your role. I'll be focusing on the website design and development process, talking about where project management fits in and how it can benefit everyone involved. I'll look at issues like resolving conflict and managing people who have different work styles.

Why you need it

What makes a project go awry? Common reasons include communication issues, poorly defined roles and responsibilities, distributed teams and the dreaded scope creep. For example, most issues you have getting older versions of Internet Explorer to play nicely with your design aren't something project management is going to help you with. However, if your developer is frustrated because they never knew they were going to have to support those older versions of IE and now has a week to do something that might take two, that's something that good project management could have helped you avoid. >>

Words Keith Robinson has been working on the web for more than 13 years. He started his career with Microsoft and is founder, principal and creative director of Blue Flavor. www.blueflavor.com

Image ilovedust is a studio providing creative solutions for print and web. www.ilovedust.com

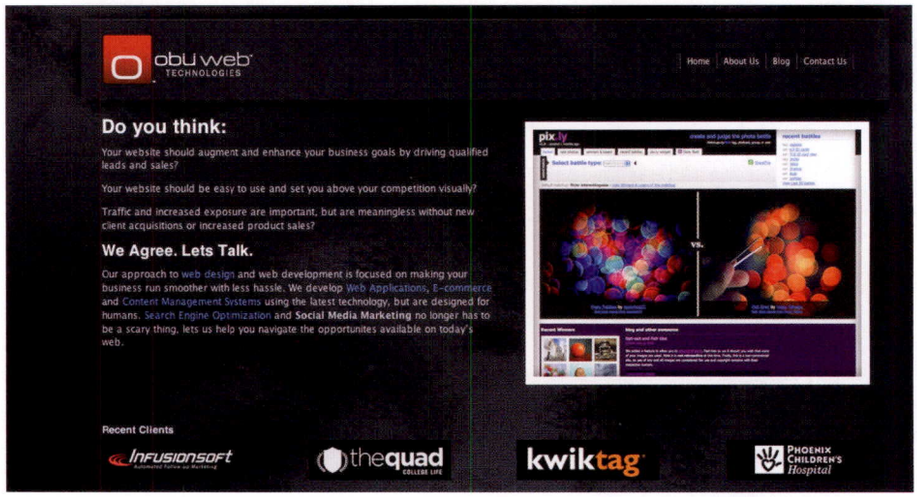
Case study Mithun

Designer Tom Watson talks about being both a creative and a project manager on the Mithun redesign.

Mithun, an architecture firm in Seattle, asked Blue Flavor to redesign its site (mithun.com). Tom Watson, one of the agency's designers, was assigned to be the project manager, information architect and visual designer for the project. "I expected it to be a challenge," he recalls. "Because of the creative nature of an architecture agency, I knew I'd have to take a deliberate approach to project management and the review process, and be sure to build relationships with people on their team. Keeping this project running smoothly was going to be difficult.

"Luckily, I was able to work with two incredible people on their side who grew to trust my opinion. Building their trust for my ideas early was critical to the project's success, because once we moved to the larger group meetings with all of the stakeholders, I wasn't alone when presenting the design to an entire room – I had internal advocates. I was also careful to make sure I listened to their ideas, answered their questions thoroughly in a timely manner and guided them to best practices when appropriate.

"In the end, trust, patience, listening and hard work were the key factors that made the Mithun project a success."



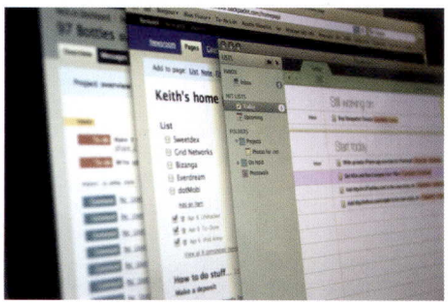
End game Web agency Obuweb sees managing both team and client expectations as central to finishing projects on time

>> I'd estimate about 90 per cent of good project management comes down to communication. This means there's no silver bullet, magical software, productivity method or process that will solve all your project management woes. No, instead you're going to have to rely on people. And not just any people. You'll need to rely on everyone on your team, from your stakeholders and clients to the creative and development teams.

Don't confuse project management with project manager. Sure, it's best to have someone dedicated to the role, but good project management is not any one person's responsibility. That's one of the major problems and misconceptions. If you put the sole responsibility for a project on one individual, you're bound to run into problems.

Having said that, every project, except perhaps the very smallest, can benefit from having a dedicated project manager. It can be beneficial to have someone who has core skills that lie elsewhere. A designer, for example, can be a great project manager on design-focused projects. They'll have a strong understanding of the actual work involved, which can be very helpful.

Project management, ideally led by a dedicated, hard working project manager, is there to help solve problems – whatever they may be. This is done, as I've said, mostly by managing communication between team members, but it's also done by adding structure and organisation around the process involved with creating a website. Let's take a look at that process.



Teams not tools Project management software can help, but at heart it's about human relationships, not techie fixes

The process

There are many ways you can build a website and a solid understanding of the website design and development process can help put the role of a project manager in its proper context. I'm going to outline the basic process we use at Blue Flavor, but there are many other ways to do things that are just as valid. It's important to note that we adjust our process according to each individual project. What follows will be a simple and generic framework that I'll use to outline where a project manager can step in to help mitigate potential problems. In brief, our process goes like this:

1 DISCOVERY We set goals, roles and expectations. We gather information and assets, create schedules and plan meetings. We outline opportunities and come up with a solid plan for executing ideas. The project manager's role is very important during discovery. They'll be expected to organise and communicate the overall plan and be 100 per cent sure everyone knows that plan and their role within it.

2 DESIGN This usually starts with brainstorming and setting some structure around what is actually going to be built. We define any processes, interactions, layouts and so on and flesh them out in an iterative manner.

The design process is much more cyclical and repetitive than the rest of the phases and is insular in some ways. Here, a project manager's job is to make sure designers keep in contact with the rest of the team and call out any issues that may arise.

3 DEVELOPMENT This phase, while still a little insular, is much more linear than the design phase. If things have been done right, the developers will have a pretty clear idea of what needs to be done and should be able to move forward without much involvement (distraction) from the rest of the team.

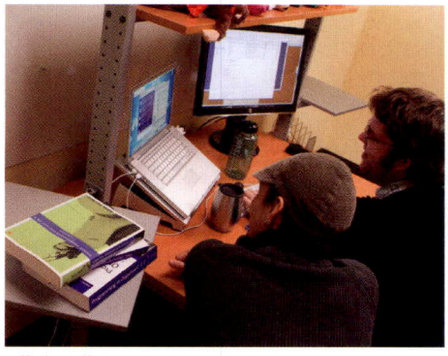
A project manager's main function here is to make sure the development team has everything it needs to execute and work as an intermediary between them and everyone else.

4 TESTING AND QUALITY ASSURANCE This is generally pretty straightforward. We test our sites and make sure we've done everything we agreed to do. Here, the project manager is responsible for making sure that the last five per cent of the project has been completed and that we've done all that the client has expected of us. The project manager is also there to make sure any hand-off between the design and development teams and the stakeholders goes smoothly.

> "Getting the team and your client to sign off on 'good enough' is important" Joshua Strebel

That's a brief rundown of a typical project's process, with some insight into where a project manager fits in. In addition to those things I've outlined here, it's vastly important to have a project manager that sees the big picture and has an eye for the project as a whole as it progresses. One area where good project management can be a huge help is with hand-offs from phase to phase.

For example, the hand-off between the design phase and the development phase is often tricky. As with many other problems that crop up over



Talk the talk Project management is about communicating clearly and often with clients and team members

the course of a project, the problems that arise here are generally related to communication. Designers and developers very often think and work differently and a good project manager can help facilitate these hand-offs, so that everyone is given the best opportunity to succeed. I'll cover that more later on.

Now that we've got a handle on the basic process, let's get into some specifics of what makes a good project manager.

The basics

The first thing you should know about project management is that it doesn't need to be complicated. Don't be fooled by thick books or year-long certification courses. The basics of project management – the important stuff – are pretty easy and mostly common sense.

Look at what you need to do. Break it down. As a project manager you're probably not going to have to do all the work yourself, you just need to make sure that it gets done, is done right and is done on time. Ask yourself what tools you need to ensure that this happens. These will nearly always include a proper plan, good people, clear expectations, good communication, a timeframe, deadlines and a budget. If you really take the time to look at it all, you'll no doubt see that, with a little thought, what seems like a huge project can actually be pretty manageable.

I think one of the biggest problems with many project managers is that they tend to overcomplicate things, or they force you into an overly rigid or complicated process. This makes everyone's job harder. The idea is to work on the project, not for the project.

So where do we start? How about at the beginning? Kick off each project correctly by making sure you fully understand it. Learn everything you can so that you can discuss it in the detail it deserves with your team. Depending on the task in hand, I like to use a checklist when doing discovery for a new project.

- What are the project's goals?
- Who are the stakeholders?
- Is there a hard deadline?
- What are the roles?
- Have expectations been clearly set for everyone involved in the project?
- Have the processes for changes and dealing with problems been communicated to all team members? (This is an important one.)

The idea is to gather, then disseminate, as much information as possible. Don't be stingy with information: make sure everyone knows what's expected of them. Setting expectations (and resetting them as the situation calls for it) is key and should be done at the start of the project.

I don't know how many times I've seen a project go off the deep end because someone didn't understand their role on it. That should never happen. If someone doesn't know what they're doing, they should feel like they can ask before the project gets going. It's a good idea to check in with everyone involved to make sure they're all clear on what's going on.

Once you've set the stage, you'll likely focus on communication and keeping everyone organised.

Communication

A good project manager communicates often and clearly, and is available and >>

Q&A Entrepreneur Joshua Strebel's tips on that final five per cent

Joshua Strebel
Job title Web entrepreneur
Company obuweb.com, bestpartyever.com
URL saint-rebel.com

"Last 5 per cent of any dev project is always the least fun for me... all the minutia." This Tweet by business owner and web developer Joshua Strebel, president of Obuweb.com and COO of Bestpartyever.com, struck a real chord, as finishing a project is often said to be the hardest part. We asked Josh if he could shed some light on the art of finishing.

.net: It's often been said that starting projects is much easier than finishing them. Why do you think that is?

JS: Psychology. A new challenge, a new project – a new new. Everyone is happy to be starting something new. The novelty of a fresh project gets you, your team and the clients excited. But as the project wears on, the shine wears off. Clients become less responsive, coders get tired of the same code and so on. The anticipation of the next new project makes the current one seem tedious and boring.

.net: Do you have any tips for getting over that final five per cent?

JS: Early in the project – and again somewhere at the three-quarter mark – it's important for a project manager to establish/re-establish the expectations of what a finished project will look like and stick to it. Managing both team and client expectations is key. Be sure that they understand that 'done' really is done and that new requests will get backlogged into a new project, not appended to the current one.

It's important to realise that a web project will NEVER be 100 per cent finished. So getting the team and your client to sign off on 'good enough' is important. Finally, lock yourself in a room with your final to-dos, bugs and so on, with some loud music – no Twitter, no Facebook, no anything but you and that final bit of work you need to finish.

Better client relationships

Tiffani Jones, account manager for Blue Flavor, gives her tips on improving client relationships.

Be client-focused. I think I first heard the statement, "Remember you're selling to real people under stress" from Howard Mann. Your clients are just like you: busy, and interested in saving time while making money. Take time to fully explain yourself in terms that normal human beings who are in a hurry can understand.

You should value (and maybe even actually like!) your client and be thankful for the opportunity to work with them. If you need inspiration, go visit your favourite café and reflect on this. You may be a designer, but you're in the customer service industry too, my friend.

Be explicit. Good client relationships are no different than personal ones. They're built on solid assessment and communication skills. Clearly communicate your expectations at the beginning of each project: thoroughly outline scope, budget, contract fees, what you expect from your client's team, what they should expect from yours and so on. It may take a bit more time, but defining roles and expectations early on will save you hours upon hours of head and heartache in the long run.

Be a subtle communicator. Sometimes even the most savvy clients don't know how to say what they want to say, or ask what they want to ask. That's because they're not experts in your field. You, on the other hand, are. Thinking from the client's perspective (also known as a business-minded perspective) requires that you listen to the subtleties of what a person says, considering and filling in whatever gaps exist.

Take time to explain your own ideas and choices fully, in a way that a non-expert can connect with and understand. Try intuiting what's implicit, then make it explicit, and you're golden.

Busy doing nothing? Working harder doesn't always mean smarter

Chew on this It's less about high concepts, more about practical goals – including making time to eat!

>> accessible if someone has questions. This means answering your phone and checking your email regularly and being open to different communication styles. Your developers, for example, might prefer email to the phone and that's okay most of the time. But some conversations are better done in person, no matter how you or your teammates prefer to communicate. If something isn't getting through via email, schedule a face-to-face to talk it all out.

Always err on the side of overcommunication. It's possible to communicate too much and cause unwanted distraction, but in my experience that's better than communicating too little. If you ever get the feeling that someone doesn't understand their role or what they're supposed to be doing, stop and schedule a chat to work it out. Another good practice is to work on your writing skills. All of your documentation should be easy to follow. Keep it simple and use plain language.

If you're working on your communication and doing a good job there, you'll be 90 per cent of the way towards being a great project manager. Much of the rest, when it comes to the day-to-day, is related to organisation. You'll want to make sure you're on top of schedules, to-dos and milestones. It's important not to overmanage your team, though. Keep watching everything, help out when needed, but don't become a pest. There's nothing more distracting to a designer or developer than an overzealous project manager sitting at their desk asking, "Are you done yet?" over and over.

Keep an eye on things and speak up when anything seems to be going a bit out of control. Most projects that I work on generally go pretty smoothly, as long as there are no communication issues. There are times when problems will arise and when they do, you'll need to be ready to jump in and get your hands dirty. However, if you've made sure that you've set the proper expectations and communicated everything properly, it should be within your power to resolve those problems. So, to sum it all up:

> "A good project manager stops me from becoming a bad client" Marty Roberts

- Take the time to really understand the project.
- Ensure you set expectations. Everyone should have a solid understanding of their role and the way forward should be clearly mapped out.
- Communicate often and adapt to your team's communication and work styles. All this really needs is a bit of effort and understanding.
- When in doubt, overcommunicate.
- Keep on top of milestones and schedules, but don't pester your team.

Building trust Redesigning architects' site mithun.com was all about listening and responding to clients needs

Dealing with complicated issues

So far I've painted a pretty rosy picture of the process. Set proper explications, keep lines of communication open and keep an eye on the project and everything will be fine! Well, ideally, yes, but sometimes we come across problems that lie far outside of our control. So, what do we do when things break down?

First, you need to understand the problem. If you've been communicating and have a good relationship with everyone involved, it shouldn't be too much of an issue to delve down to the root of the issue. When it comes to websites, the most common place that projects break down is when something hasn't been scoped properly or expectations don't match up.

This doesn't have to be a nightmare. Simply open the lines of communication, discuss the issue openly and frankly and reset expectations. Move forward based on new information, regardless of what the actual problem is. It comes back to communication: if you're communicating clearly, you'll have a better chance of resolving your issues.

You'll also want to go back to your (hopefully) clearly described process for dealing with changes. If your team has done a good job and understands what to do when there's a problem, it comes down to formulating a new plan, resetting the resultant expectations and getting back to work.

Finishing up

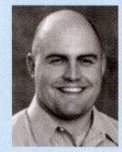
The last five per cent of your project is always the hardest. Often you'll have a few small, outstanding issues lingering. The best way to wrap up is to set your team a hard deadline and stick to it.

Always keep in mind that the project as a whole is more important than the tasks and details that make it up. Also, with website work, the end product is never really 100 per cent finished and you can always go back and make fixes and changes should you need to.

Project management isn't easy – it's a whole lot of work – but it's important. All it takes is effort, a bit of know-how, good communication and organisation skills, and a willingness to see things through. If you've got that, you've got the makings of a fine project manager. ●

WWW. *Do you manage your projects professionally, or just wing it and hope for the best? Share your experiences at forum.netmag.co.uk.*

A client's perspective



Marty Roberts of white-label video management and publishing company thePlatform (www.theplatform.com), explains the benefits of project management from the client's perspective.

As a client, the major benefit we see in using an agency with good project management skills is that communication keeps flowing. Being super-vocal about progress updates, tracking down dependencies (especially ones that require my involvement) and identifying sticking points are all really important. There are systems, like Basecamp, that help with this, but they're no substitute for a dedicated person thinking holistically about the project and its objective.

Good project management also results in time-boxing the creative process. Of course, with every extra day of design or development the end result may be better, but at some point someone needs to say it's good enough and move on. The project manager helps manage this compromise.

Finally, a good project manager stops me from becoming a bad client. It's my money and I'm ultimately accountable for the project but if I'm allowed to continually change the scope, no one wins. A good project manager will incorporate my feedback as appropriate and explain the impact of a change request to the cost and time.

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Breathe new life into your websites

Make some noise online by giving your sites a well-considered refresh. **Craig Grannell** finds out how to clear away the cobwebs

As the global economy continues to stutter its way through 2009, companies are increasingly fighting to be heard. In recent months, investment has shifted abruptly from traditional media and 'real world' environments to the internet, which provides the means to reach the largest possible audience in a relatively cost-effective manner.

In theory, this is great news, but in practice the picture isn't entirely rosy. As Clearleft's managing director (clearleft.com) Andy Budd explains: "Many people view a website as a one-off project, rather than an ongoing concern. Organisations often go through a big redesign and then let a website fall into disrepair." Instead, he recommends training yourself and your clients to think of a website as a staged process, which should be updated every three to six months: "That way, it'll always be up to date and will last longer, rather than spending the majority of its life underperforming."

Instead of tearing a site down and rebuilding it from scratch, figure out ways to make the existing site work harder. "Breathing new life into a site through a design refresh is one such option," suggests Budd. "Smart companies also explore usability improvements to help conversion rates – small tweaks to registration and checkout processes can see conversions skyrocket and pay for themselves in no time." The trick is in knowing the difference between an expense and an investment. While some sites are too outdated to make do with subtle tweaks and need a radical revamp (see the STRADA case study on page 28), you can often do a lot with a little, thereby finding yourself in tune with companies cutting back on large capital expenditures.

Back to basics

Even if you only want to make small changes, Alex Willcocks, creative director at Engage Interactive (engageinteractive.co.uk), recommends approaching your site refresh with an open mind. "Sometimes going back to

>>

Words Designer, writer, musician and regular .net contributor **Craig Grannell** has authored a number of books on web design. craiggrannell.com

Image Knight Design Studio is a Bristol-based graphic design agency.

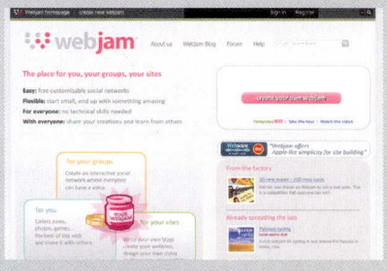
Case study Webjam

User experience designer Sjors Timmer talks about delivering the right message to the right audience in his company's recent site refresh (www.webjam.com)

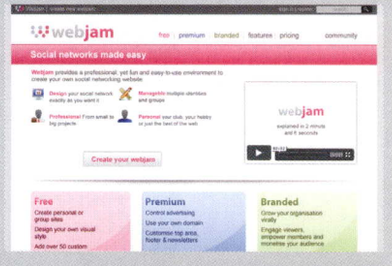
Most of the changes during the Webjam refresh were on a conceptual, hierarchal, visual and textual level, rather than based around technology. We decided to refresh the site because our business model evolved from targeting individual users to also including organisations and brands. The homepage and the pages that explain our services particularly needed updating to ensure that they conveyed the correct message to the relevant target audience.

Our main aim was to communicate the new business strategy to our three types of user: private individuals, small groups and large organisations. Therefore, all the pages needed to be checked against our main questions: what are we trying to communicate and to whom? Using an Agile-style process, we combined the needs of the business team (who want to sell to medium to large businesses) and the product team (who represent the individual user) into one set of pages. Once the first phase was live we found that we could still improve things, so we ran the cycle again.

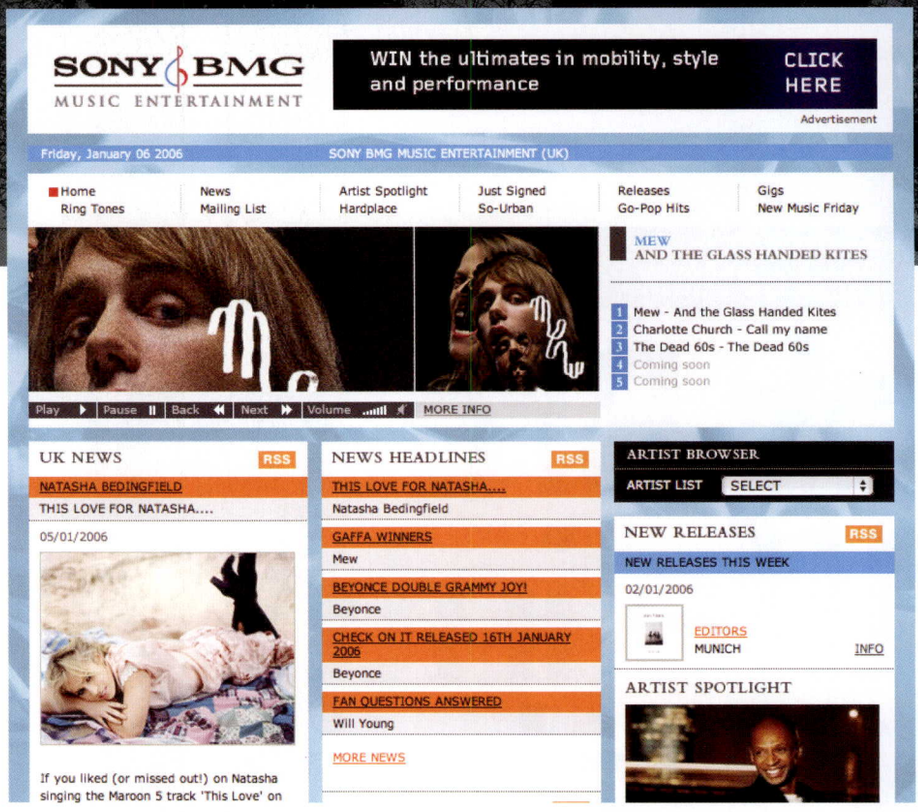
You shouldn't wait until things turn bad to start fixing them – you should start working to make them even better while they're still good.



New approach Webjam decided to align its website with its evolving business model



Fresh look The newly refreshed Webjam site (webjam.com) targets specific types of user, and enhances both usability and the site's visual appeal



Early days Kleber's initial site for Sony Music UK (sonymusic.co.uk) settled on a bright 'liquid 3D' theme

>> the beginning and thinking from that standpoint can bring surprising results," he says, "especially with the number of resources available to web designers increasing all the time." However, there are certain tried and tested considerations that will almost always play a part, including tweaking content, amending graphic design and integrating new components.

It's essential to consider how each element works in a modern context, especially if a site is long out of date. "Users want information quicker than ever before and if you don't supply it, their interest will move elsewhere, regardless of whether you're a trusted brand or resource," argues Tim Gibbon, director at Elemental (elementalcomms.co.uk). He reckons there's a desired immediacy to website content and structural revamps must take this into account. Now isn't the time to be coy; tweak homepages so they enable users to rapidly access the most important current content, rather than making them hunt for it.

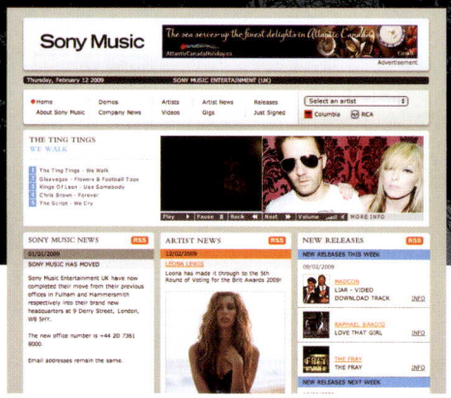
> "Clients may want to hold onto things that have been successful" Elliot Lewis

Alec East, director of Do Tank Studios (www2.dotankstudios.com), adds that immediacy in modern sites sits alongside a certain informality. Often, just changing the name of a site's sections results in something more contemporary. "There's a move away from 'catalogue' and 'about us' to more descriptive and cognitive terms, such as 'men's shorts'," he says. This assists users in finding specific types of content in a more intuitive manner than when generic terms are used and improves things from an SEO perspective. And on the subject of search engines, East points out that they've become the only way many users find information online. "Since most people find a site via a search engine, they could enter anywhere," he says. Consequently, during refreshes, it's important to consider whether it's obvious how to navigate straight away, regardless of where you enter, and whether basic information about the organisation needs to be available site-wide (such as in the footer), so new users immediately know a little more about the site they're visiting.

Content matters

The oft-wheeled-out mantra in web design circles is 'content is king', but text is no longer the absolute ruler it once was – something to be mindful of during refreshes. As CEO of Modera (modera.net) Siim Vips notes: "Scaling down text content is popular, since there's too much information available online anyway and excessive copy can negatively impact on a website." Elliot Lewis, creative director of No Two the Same (www.notwothesame.com), adds: "A CMS of some sort is becoming a prerequisite, but this puts copy in the hands of clients, which isn't always a good thing."

Ultimately, the level of control clients should have regarding copy comes down to their skills and



Pure and simple By 2007, Sony felt its site was no longer suitable, and a refresh implemented a simpler design

designers need to guide clients who don't have appropriate in-house resources available, helping them outsource to copywriters where necessary. For any components that can be edited, you need to keep the refreshed text succinct and avoid duplicating information, both so users don't get bored and so clients have less scope for fiddling!

Graphical refreshes also offer a huge range of options, although they can be tricky to get started. "Clients tend to want to hold onto something that's been successful for them," argues Lewis, adding that, while stagnation is dangerous, so is "jumping on any current trend – such as shiny surfaces – that may make a site look tired very quickly." Vips adds that, although consumers generally like to see progress, they're typically shocked by sudden, radical changes. He suggests making subtle visual refreshes that are small and gradual, such as amending backgrounds, while East reckons designers should consider the merits of craft-based design. "I'm not just talking about hand-drawn elements," he adds, "but also letterpress-style typography."

Style with substance

For some, though, a site refresh provides the opportunity for a more drastic visual overhaul. It can often be tempting to pepper 3D, video and animation components about the place, or to update tired-looking components such as forms with spangly new CSS and imagery. Whether you should use such technologies or not depends on their relevance and the site's intended audience. "3D and video can quickly bring a message across that would have taken many paragraphs of text to explain, but these things can also be distracting and should only be used when they serve a communicative goal," recommends Webjam user experience designer Sjors Timmer (www.webjam.com). "And if convergence is your goal, it may be wise to leave standard web components such as form elements the way the browser renders them, so people can recognise them immediately and understand how they work without explanation."

In contrast to streamlined static copy, the amount of content integrated into commercial websites via social media is likely to grow substantially during 2009 as businesses catch up with the masses – something savvy designers can take advantage of. "Social elements are becoming very important, with users increasingly expecting to see other people's recommendations, share content and interact with brands," says Ané-Mari Peter, managing director of on-IDLE (on-idle.com).

She suggests that site refreshes should, to some extent, centre around user experiences becoming one-on-one, rather than the old-fashioned 'one-to-broadcast' style that most sites cling to. "Adding a newsfeed – with relevant content – or a blog increases the currency of a site and helps to develop a deeper relationship with a site's users," she says. And whether you're going for an off-the-peg or bespoke solution, these aren't massively expensive components to set up and integrate. It's also possible to use blog headlines and Twitter updates for portions of a homepage, ensuring that a site appears to update on a regular basis between major events such as product launches.

The biggest danger with social networking is that some companies see it as an easy option during a refresh, not fully understanding what it entails. Forums might, on the surface, seem an enticing prospect, potentially reducing support queries and getting users to help each other, but they can be costly to maintain and police and shouldn't be seen as a replacement for existing services. There's also the risk of, as Peter puts it,

> "Scaling down text is popular. There's too much information online anyway" Siim Vips

Case study Cravendale (milkmatters.co.uk)

Outside Line graphic designer Derek Boateng (www.dekr.co.uk) discusses a website refresh for a major UK grocery brand that shows how interactivity can help fulfil a brief

Cravendale is the UK's biggest milk brand and to stand out from the crowd, it has to act differently to the competition. The website that ran during 2008 was a success, but we wanted something for 2009 that stood out both design-wise and technically. Cravendale's brand messages have also evolved and needed incorporating. These include its milk being filtered for purity, lasting longer than other milk and being sold in a white bottle.

The resulting website refresh isn't just a series of pages offering information about milk – it's about different initiatives and microsites created to appeal to the widest audience possible. For example, there's MakeTheTea.com for offices, MyCravendale and Wise Old Cow for kids and Gran Slam for elderly visitors.

We wanted people to spend time on the site interacting with the brand, even before they'd visited any of its sections. They can do this by playing with the blocks and throwing them around the screen. There's even a game of basketball in there if they fancy it! We also created a series of animations that serve to drive home the key brand messages in a really fun and engaging way.

Of course, all components must have a purpose relating to the desired goal of a website. Designers should be careful of implementing technology just because it's popular at the moment. Use of new tools and exploration in web design is great, but the overuse of this type of technology gets boring really quickly and dilutes the website's message. But animation and 3D should nonetheless always at least be considered when refreshing a site, along with anything else – it's all fair game as long as its final use benefits a site's redesign, helps you answer the brief and provides a real purpose in the site message and aim.

With the Cravendale website, this was definitely the case and after the site was refreshed and went live, traffic increased by 400 per cent in the space of a month. More importantly, visitors were spending an average of eight minutes on the site, as opposed to four minutes before the refresh.

Reinvigorated The website refresh (left) for Cravendale (milkmatters.co.uk) ensures that the brand's message remains current and reinvigorates the site with new content, animations and games to hold users' attention

Case study STRADA (strada.co.uk)

Alex Willcocks, creative director of Engage Interactive (www.engageinteractive.co.uk) explains how he helped a restaurant chain's website to flourish

The current economic climate has prompted dramatic changes in the leisure industry. With luxuries hard for consumers to justify, companies are fighting a loyalty war. By concentrating efforts online, brands can achieve the most immediate and effective results.

STRADA's old site suffered in various ways. The lack of a CMS meant updates were costly and sporadic and the site was essentially 'brochureware', merely providing location and menu information. We wanted the site to set a new benchmark in the industry, performing and looking better, maximising on its high volume of hits and customer loyalty.

We revisited the site from the ground up, discarding 'standard practice' approaches. It needed to promote offers, news and events and provide essentials, such as restaurant locations and menu downloads. We also set goals for data capture, confident we could dramatically increase the size and quality of the database. With this in mind, we launched the site alongside stradaoffers.co.uk, where two-for-one meal vouchers are exchanged for a user's email address. This site received over 100,000 visits in its first week online, resulting in a 500 per cent increase in the database.

As for the STRADA site itself, a significant driver during development was the company being able to self-manage content. Our in-house CMS was deployed, enabling STRADA to add and amend locations, menus and news.

The site – including the CMS – is built on the CodeIgnitor framework. Features such as built-in SEO-friendly URLs, validation and email classes reduce development and testing time and the MVC structure enables designers and developers to work simultaneously.

The maturation of jQuery also unleashed a wealth of opportunities. It helped us make the STRADA site quite exploratory in terms of the user interface, while allowing a safe fallback for users with JavaScript disabled.

Although it's early days, the refresh results are promising. The bounce rate – people immediately leaving the site – has dropped from 70 per cent to just 20 per cent, visits are up 80 per cent and on-site time has doubled.

Above The old STRADA site was little more than 'brochureware' and the lack of any kind of CMS meant it was irregularly updated

Left Although significantly prettier, the real success with STRADA's revamp (strada.co.uk) is in its visitor retention and a substantial increase in the marketing database

Tree-mendous Clearleft's refresh of classified ads site Gumtree began with an expert usability evaluation

>> "keeping up with the Joneses", whereby companies buy into social media only to rapidly lose interest when the costs, in terms of time and input, become clear. "If you want to start a blog and get on Twitter, make sure you've got something to say and be prepared to listen to feedback," advises East. "Don't do it if you can't commit to regularly updating it." As long as that's understood, companies should be taught to embrace social media as fully as possible, even going so far as encouraging users to use Twitter to give feedback, rather than just sending questions via email. Brands must also be made aware that immersing themselves in social media can backfire massively if they attempt to subvert it. "Users have become adept at sniffing out planted reviews and information," warns Peter. "Companies must avoid abusing their 'new toys' and designers should provide guidelines before unleashing social components during site refreshes."

Ready-made tools

One of the biggest advantages of social media during site revamps is that the relevant platforms already exist. If you're working with Twitter, the tool is built, ready and waiting. If you're setting up a blog, various solutions exist that can be integrated into a site in a relatively short space of time. Designer Chris Garrett (chrisgarrettmedia.com) thinks this is a major advantage: "In times of financial uncertainty, clients are less likely to want to be tied into proprietary platforms. Utilising open platforms with documented APIs can help win business because the client knows they'll be able to continue working with the platform if their supplier goes under."

Also, for smaller components, ready-made tools can increase a site's usability for little cost. During the 1990s, designers toiled for hours to craft fairly unhelpful location maps, but now Google Maps can be welded to a site with almost no effort. So if a client asks for a solution to a problem during a refresh, search around to see if a relevant and freely available component already exists before considering building one from scratch. "However, business owners must examine legal and consistency risks before integrating third-party APIs," warns Vips. He argues that to minimise risk you must have a contingency plan in case services drop or vanish – not least because many APIs are in a perpetual state of beta.

> "Going back to the start can bring surprising results" Siim Vips

Garrett argues that such risks are outweighed by potential rewards. "APIs have gained massive traction in web applications, but we will no doubt see even more widespread adoption," he says. "Simply adding an RSS feed to a website enables people to repurpose content in a plethora of ways, increasing your reach exponentially and for little cost. With a cut in marketing spend, making your content open and reusable can be a cheap, effective way of reaching new consumers."

Of course, structure, content and even component integration aren't new, even if they're being used in new ways – they've been around since the dawn of the popular web. Today's market, however, finds a major new spanner in the works when it comes to refreshing websites: mobile.

Going mobile

Usability guru Jakob Nielsen confidently predicts, "The trend towards increased use of mobile websites is no doubt the most important challenge facing web designers in 2009." People are clearly shifting from desktops to mobile environments

Clearer path Clearleft's Sci Fi Channel refresh (scifi.co.uk) improved the visual design and the way users navigated the site

for browsing and many upcoming refreshes will largely avoid the 'main' website and concentrate on targeting mobile users. "That prompts a big strategic question," says Nielsen. "Whether to design a separate mobile site or make the main one mobile-friendly."

The direction to take depends on your target audience. Although it's easy to assume that mobile users mostly browse on the move, plenty of people prefer general surfing using an iPhone rather than a laptop. Therefore, find out how your site's users interact with content and develop accordingly.

Nielsen says that a dedicated mobile site with fewer features is best. This should be optimised for smaller screens and pointer/finger-based input, with links to the 'main' site for users who require more advanced features. However, a client may balk at the cost and there is another way. During a refresh, ensure the main site has clean, semantic markup and a layout driven by CSS, then create a style sheet specifically for mobile (using relevant code to 'sniff' mobile browsers such as Safari that effectively consider themselves desktop browsers). It'll be the same site, but you can simplify the design and make content more readable and usable for mobile devices by adjusting text size and the positioning and visibility of page sections.

East goes further than that, arguing that designers should take advantage of a refresh to make a site work on everything: "Not just IE, Firefox and iPhones, but other mobile devices and the Nintendo Wii. It could be years before your next refresh and web-enabled next-gen TVs will arrive before then. Don't deny them access!"

Perhaps an awareness of that simple fact – that the web was always supposed to be about accessible information – is the biggest advantage you'll have this year when it comes to reworking websites, whether for yourself or your clients. ●

> "Users increasingly expect to see other people's recommendations" Ané-Mari Peter

WWW. *Are you planning a site refresh? Share your experiences at forum.netmag.co.uk.*

Case study Colombia Records

Tom Muller of Kleber (kleber.net) explains the reasoning behind a subtle yet effective design refresh for the Columbia Records UK site (columbia.co.uk)

Kleber was asked to create a website for the Columbia Records label. Columbia has a strong brand identity and it was important when designing the site to keep to the three core colours: red, black and white. Like its 'big sister', the main Sony Music site, the Columbia website is content-heavy, with plenty of audio and video on the homepage alongside a bevy of news headlines, releases, tour info and artist spotlights. Shortly after the site was launched, however, the client felt the design was too 'clean' for the artists who were signed to the label, which is geared towards rock and less towards 'mainstream' acts. The site needed to reflect this in its design and so we were asked to 'roughen up' the site, along with implementing layout changes to accommodate various banner ad programs that are run by the label.

The current iteration of Columbia has been running since late 2006, but subtle changes are regularly implemented to keep things running smoothly. For example, we recently overhauled the way media widgets are created and added. Such minor refreshes aren't always noticeable to the public, but are important in the day-to-day business of running large websites.

Clean living Sony felt that the original Columbia Records website didn't reflect the label's style

Rough and ready By subtly 'dirtying' the graphics, the result is more fitting, highlighting how even relatively quickfire changes can benefit a website

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"Flash can do whatever a designer can imagine it can do. The only limit is your imagination"

Eric Jordan, 2Advanced

www.2advanced.com

2Advanced is one of the most respected design agencies on the planet. Chief creative officer and president Eric Jordan tells **Oliver Lindberg** how Flash changed his life, what he's looking forward to and why DJing keeps him sane

Whenever Eric Jordan immerses himself in a project, he doesn't really sleep. He puts on his headphones and spends dozens upon dozens of hours in front of the computer, working through nights and weekends. Fortunately, the hard work always pays off. Californian digital agency 2Advanced has been at the forefront of innovation for almost 10 years. When it unleashes a new site, the whole web world sits up and takes note.

For Eric Jordan, president and chief creative officer at 2Advanced, it's a dream come true. "This will probably frighten some people," he laughs, "But I'd probably do this for free if I could. It's really not a job to me. I'm able to create art for a living and I think that's all anyone can ever hope for."

Originally, Eric wanted to be a comic book artist. "I realised that I loved telling stories," he explains. "I was using PowerPoint to try to create little movies that would flash from image to image. I eventually realised how limiting it was and, when Flash came about, it completely transformed everything for me. I was able to bring all these things to bear with sound and motion. It was a really powerful and defining moment in my life to find Flash."

Eric's first piece of Flash work was on his own 2Advanced.com, at the time just a small but very popular portfolio site. Then, in 2000, he wrote a chapter for a book called *New Masters of Flash*. Suddenly, Eric received recognition around the world, so he teamed up with a couple of friends and colleagues, John Carroll and Tony Novak, and turned 2Advanced into a company. Version three of the site, created in 2001, was later voted The FWA's 'Most influential Flash site of the decade'.

Today, 2Advanced is one of the most praised design companies in the world. Still, with just 25 employees, it's stayed small. The team, which manages to work on around 25 projects a year, is like a family, and business titles don't really mean a lot. The only overseas office is in Japan, although an expansion to Europe is in the pipeline. A year ago 2Advanced moved out of its first little studio and to much bigger headquarters, which Eric designed most of the furniture for.

Design idol

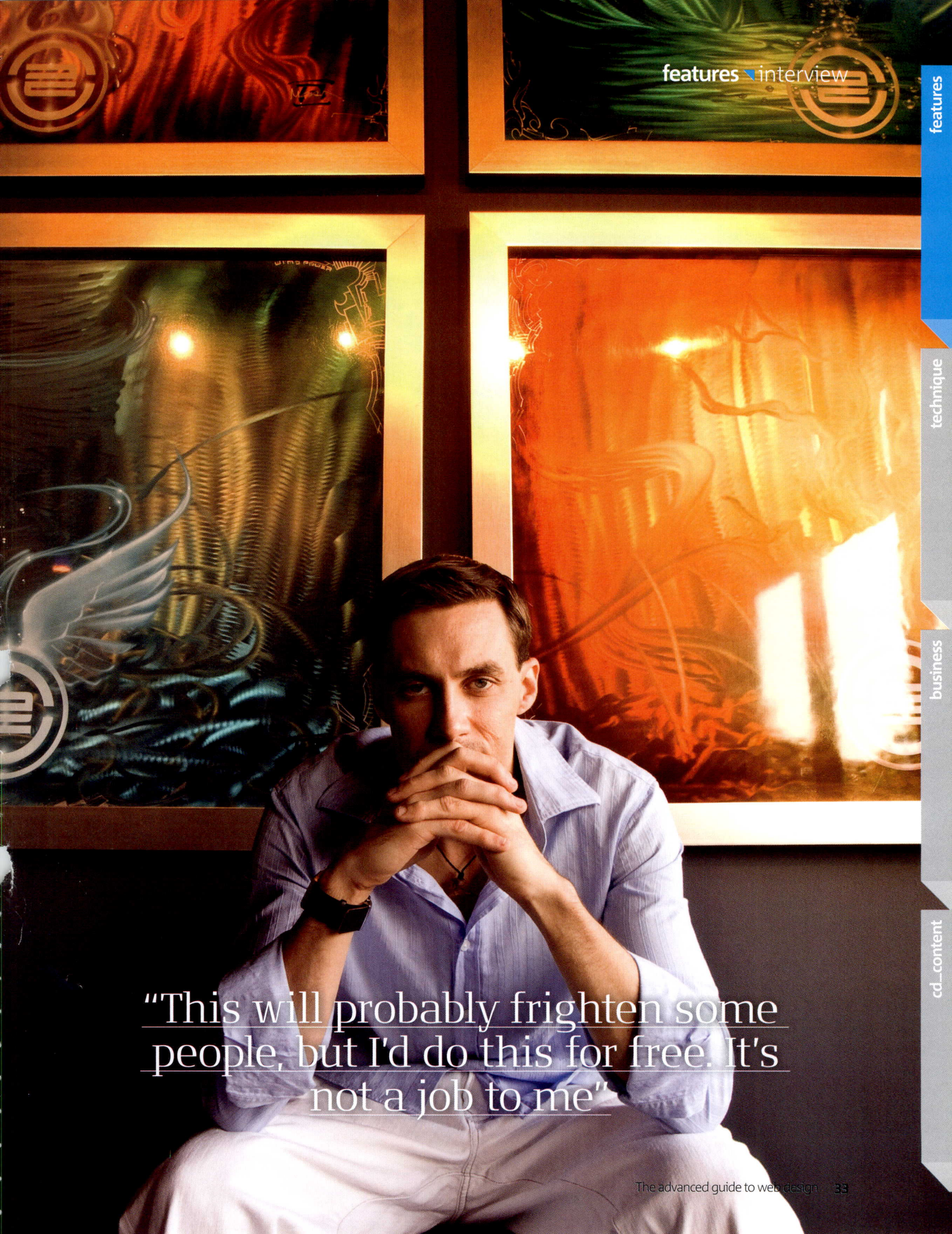
Eric Jordan himself has turned into an idol for a new generation of web designers. "It's such an honour," he says. "You know, we live in such dark times and people don't know where the world is really going. So I try to offer them a beacon of light to show them that there's hope. That's been kind of my message that I instilled in all my design."

His futuristic style is instantly recognisable. He calls it 'progressive design technology', a phrase 2Advanced has registered as a trademark. "It's an idea that everything is always moving forward, always changing, always dynamic. Staying in your safe zone doesn't change things, so you have to innovate and try to transform the medium to keep it moving. So right now I'm focusing on evolving my style. I'm undergoing a sense of change within myself. I need to take things to the next level."

Clients expect a lot from an innovative agency such as 2Advanced, so how does Eric continually come up with something new? "Everyone gets their inspiration from the outside world," he explains. "The only difference is what the person chooses to illuminate. I'm always keeping myself aware of my surroundings and keeping my mind tuned to what I find is beautiful. Whatever I can pick up on throughout the day that I can hold onto, I usually bring that to bear on a project. For example, if I'm sitting in a car and watching the rays of light bend through the glass, I hold on to that moment and later recall it when I'm creating a project. I'll try to emulate that effect in 3D if I think it's applicable."

Once creative block hits – and even 2Advanced's chief creative officer gets it, he assures us – Eric meditates, exercises and does yoga. He tries to take time away from the computer and technology to bring back his sense of vision. That's where Eric's hobby, his passion for trance and house music, comes in handy. He regularly DJs around southern California and releases mixes at his audio blog (www.neverrain.com). It keeps him sane. "DJing is also a form of storytelling," he says, "you're taking someone on a journey. With Neverrain, I try to create sets that inspire designers and give them a platform where they can drift off into another world for a little bit. Music and design are very much tied together, I think."

Recently, 2Advanced has worked with a lot of video game companies to create Flash >>



"This will probably frighten some people, but I'd do this for free. It's not a job to me"

In a flash: Web design pioneer Eric Jordan says Flash changed his life

"You have to innovate and try to transform the medium to keep it moving"

>> UIs for games, has been involved in designing menu systems and opening sequences for various movies and has even created a line of vinyl toy figurines for Adobe products. Pure web design, however, still accounts for about 80 per cent of the business. "That'll always be our core, and I never want to move away from that," Eric enthuses. "Web design is really where my heart will always be."

The same applies to Flash. "It always comes back to Flash for me," he says. "Just being able to have a program that can do so many things ... Flash can do whatever a designer can imagine it can do. There are no limitations except for your imagination. That's what's so great about it."

The future of Flash

Currently, Eric is really excited about Flash's integration with 3D in CS4. It's now so much easier to import models and bring them into your composition, which is incredibly helpful for somebody who uses a lot of 3D as Eric does. And then there's Papervision, of course.

"Papervision is an enormous breakthrough," Eric says. "To be able to give a sense of 3D on the web is something that I've always dreamed about and always wanted to see happen. It seems with Papervision that's finally starting to get here and I think it's just the first stepping stone to something even bigger. Full motion 3D environments will transform the web completely."

Another future trend, Eric reckons, will be Flash on mobile devices and smartphones. In November 2008, Adobe announced a deal with mobile processor manufacturer ARM to bring Flash 10 and Air to ARM powered devices. ARM's processors can be found in around 90 per cent of mobile phones, as well as portable media players and consoles such as the Nintendo DS. Since the majority of mobiles currently only use Flash Lite, Eric understandably can't wait to get involved and begin to create mobile web apps.

Eric is always excited about pushing Flash further. Version five of 2Advanced.com, dubbed Attractor, has already pushed Flash's usability by making it possible to bookmark and link to specific sections of the site. So naturally Eric welcomes Adobe's intention to make Flash more searchable. "I think it was only inevitable. It's such a widely (and quickly) adopted technology. The world has pretty much embraced it as the new method of delivering content. Flash is now coming into its maturity. Being able to create Adobe Air applications, things like Flex – all this is defining Flash as a more progressive medium to deliver content more effectively and intuitively."

2Advanced.com version six is in the works, but not even Eric knows when it'll be released. Always the perfectionist, he's moving slowly. One thing's for sure, though: the new incarnation will, as usual, push web design to its groundbreaking extremes. "2Advanced's different versions are never just websites to me, they're instalments in a kind of story or saga that I'm trying to bring to the world. I hope the new instalment will inspire the next generation of designers. I can just tell you that it'll be very different to anything we've done before." ●

Eric Jordan

Job President and chief creative officer
Age 30
Education California State University, Long Beach (dropped out)
Previous career Creative director for Design Insites
Blog www.plat4m.com and www.neverrain.com

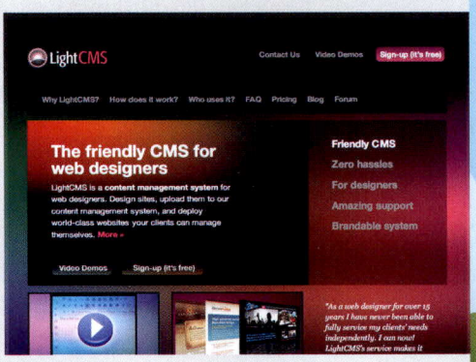
Photography/Joe Giron

technique

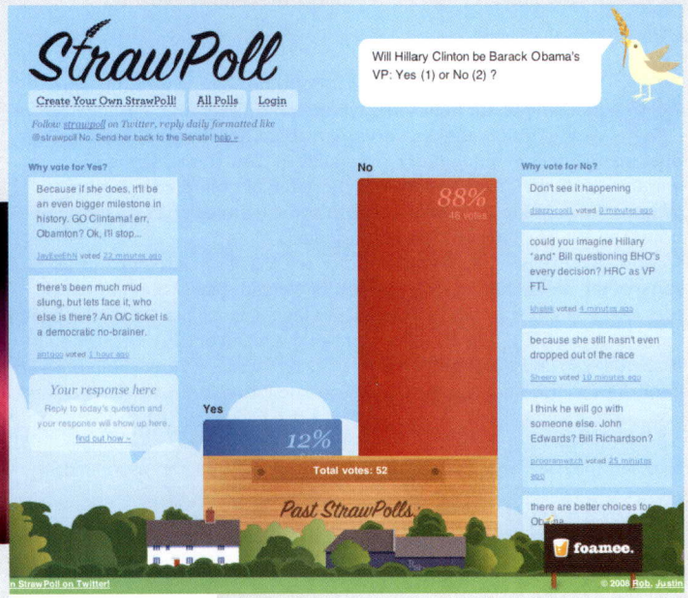
CSS

Tricks and tips for styling your web pages

(above) **Create time-sensitive sites** p40 – "You'll create a website that changes its background based on the time of day a person visits it"



(below & right) **Working with PNG** p52 – "PNG does offer something for design purposes that the GIF and JPEG formats don't: alpha transparency"



(left) **Adventurous headings** p56 – "There's no reason why we can't be a little more experimental when it comes to headings"

(above) **Integrate your images into grids** p44 – "Images can merrily wreak havoc on a grid-based layout"

On your essential CD
All the files you need for these tutorials are in the CSS folder

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/CSS/get the best out of CSS3

Your essential CD
All the files you'll require for this tutorial can be found on the CD.

Craig Grannell turns into a cross between Jeffrey Zeldman and Russell Grant, taking a peek at what the future of CSS has to offer – with a little help from Opera, Safari and Firefox

Knowledge needed Basic CSS and HTML

Requires A text editor, up-to-date versions of the featured browsers

Project time 15 minutes

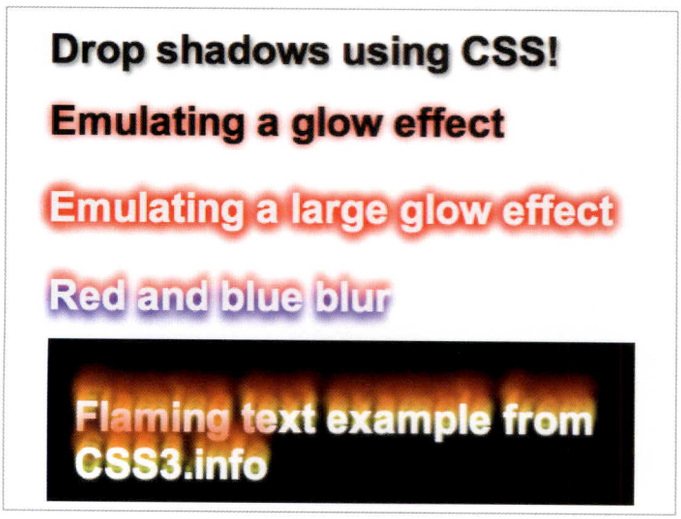
Web designers spend quite a lot of time being angry. If they're not moaning about how some typographic nicety isn't available yet for online design, they're rattling on about how Internet Explorer has once again left something nasty and smelly in their cereal. So, as an antidote to all that, this CSS article is chock-full of unbridled optimism. What we're going to do is take a look at some features of CSS3, and show how they can be of benefit to web designers.

Note that this isn't The Complete Guide to CSS3; it's a quickfire look at some of the handy stuff in CSS3 that you can already play around with. Not everything here is currently of practical use (and IE is still playing catch-up with CSS2, let alone CSS3), but it's still worth being mindful of CSS3, because some properties can add a wee bit of added sparkle to a site without compromising it for users still surfing with the digital equivalent of a surfboard made of cast iron. (Note that for this article, we used Safari 3.1, Opera 9.5b2 and Firefox 3 pre – the wonderfully named Minefield – for testing; more compatible browsers may well exist by the time this magazine ends up in your hands.)

The write stuff

One of the major benefits of CSS has been typographic control. Although a CSS ninja still can't compete from a typography standpoint with someone wielding InDesign for print, things have nonetheless progressed massively.

With CSS3, a formerly proprietary property has wormed its way into the specifications, and it's essential in these days of entirely CSS-based layouts.



Text shadow Although part of CSS2, few browsers supported text shadow, but now Safari and Opera both support basic shadows, and Opera supports multiple shadows

Expert tip Modularisation

At present, CSS3 is far from fully supported: in some cases proprietary properties (usually containing browser-specific prefixes) are required to get certain things working in various browsers. If you decide to use CSS3 on a live site, it's worth bunging all the relevant rules into a separate style sheet, so they're self-contained; this is most certainly the case for any properties using proprietary selectors. Also, for your own benefit, comment the CSS3 rules, stating what browsers they work in. This will help you with testing when browser updates are released.

By default, text overflow is shown in browsers, usually with offending copy breaking outside of its container, although some browsers stretch the container to fit the content. CSS-oriented designers will no doubt already be aware of using **overflow: hidden** to deal with the stretching problem, which typically merely lops off a couple of pixels of text if it's italicised.

However, sometimes text strings are too long to fit within a box. Although this should be dealt with by a design amendment, that's not always possible (especially with massive sites that run from a CMS), and so CSS3 offers the answer with the **word-wrap** property. Initially a Microsoft invention, it currently works in both Internet Explorer and Safari, simply breaking relevant strings as required.

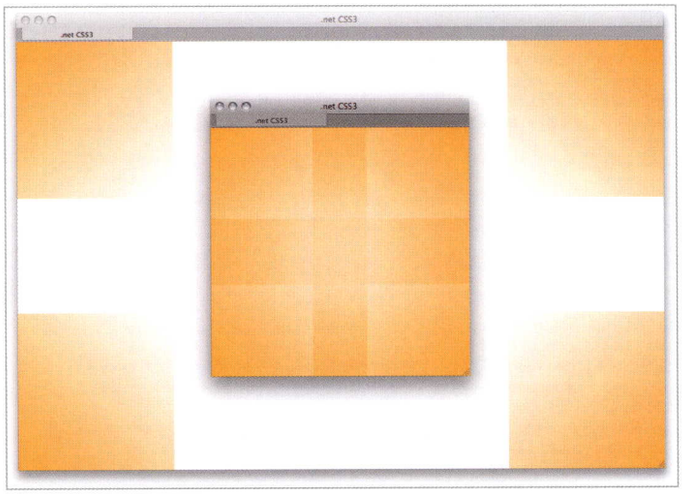
Another handy addition to CSS3 is the ability to define columns. This was touched on in issue 176's CSS tutorial, where we mentioned that the relevant properties could come in handy for displaying a list of short items over multiple columns. Take for example, the following code:

```
<ol>
<li>Donec porttitor ligula</li>
<li>Eu dolor</li>
[...]
</ol>
```

If the list has a half-dozen or more items, you'll soon be wasting plenty of space on screen. But apply a class to the list and use the following CSS and the list will display over two columns:

```
.twoColumnList {
width: 40em;
-webkit-column-count: 2;
-webkit-column-gap: 1em;
-moz-column-count: 2;
-moz-column-gap: 1em;
}
```

A width is defined and the column-count and column-gap properties automatically split up the space and position the list elements. Note that the prefixes **-webkit-** and **-moz-** are used here. In the long run, these will be dropped; currently, however, they're required to make these properties work in Safari and Firefox respectively.



Multiplicity For lovers of liquid layouts, multiple backgrounds could soon make things more interesting from a visual standpoint; only Safari currently supports them, however

Drop shadows are another recent addition to the arsenal of some browsers, although the **text-shadow** property is actually part of the CSS2 spec, not CSS3. Nonetheless, it's worth mentioning here, not least because CSS3 now also provides the ability to define a drop shadow on a box. First, however: text.

Four values are defined when using the **text-shadow** property, which is currently supported by Safari and Opera. The first two values define the horizontal and vertical distance of the cast shadow; the third value defines the blur distance in pixels; and the fourth value is the colour of the shadow. Therefore, the following CSS produces a fairly typical drop shadow that you might use to draw attention to a heading:

```
text-shadow: 2px 2px 5px #888888;
```

However, by reducing the shadow distance to zero and changing the colour from grey to something more vibrant, you can instead emulate a glow effect:

```
text-shadow: 0 0 10px #ff0000;
```

Opera enables you to take things further. It supports comma-separated value sets for **text-shadow**, enabling you to define multiple sets for a single element. This means that you can cast a like-coloured shadow in several directions to create a much larger, bolder glow effect.

Alternatively, you can mix colours, as shown in the 'red and blue blur' and 'flaming text' examples depicted elsewhere. Code for all of these shadows is on the disc, in the file **text-shadows.html**.

As mentioned previously, though, CSS3 now enables you to define a drop shadow for a box, negating the requirement to use images. Currently, only Safari supports this, although we suspect other browsers will follow suit shortly.

The de-facto property is **box-shadow**, and this is currently applied in Safari using **-webkit-box-shadow**; the values to define are as per the **text-shadow** rule.

Smoothing the edges

Shadows are all very well, but we think **border-radius** is likely to appeal most to web designers – at least those infatuated by the current trend for all things curvy. What this property enables you to do is set a radius for a box's corners, thereby enabling you to do away with JavaScript or image-based 'hacks'. Currently, this works in Firefox and Safari, and requires the **-moz-** and **-webkit-** prefixes. Because content still reaches the edges of the box in question, it makes sense to define a padding value that's at least equal to the border radius, as shown in the following code block:

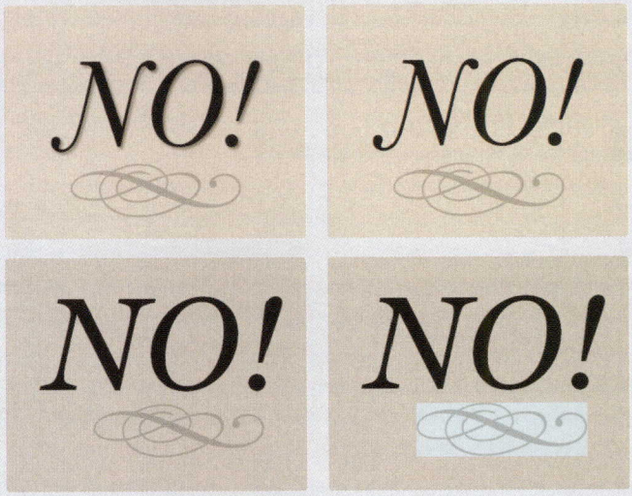
```
.roundedCorners {
width: 300px;
background-color: #d3aa9c;
margin-bottom: 20px;
padding: 10px;
-webkit-border-radius: 10px;
-moz-border-radius: 10px;
}
```

One of our favourite additions is the ability to define multiple backgrounds for an element

Working titles

Style that adapts to every browser

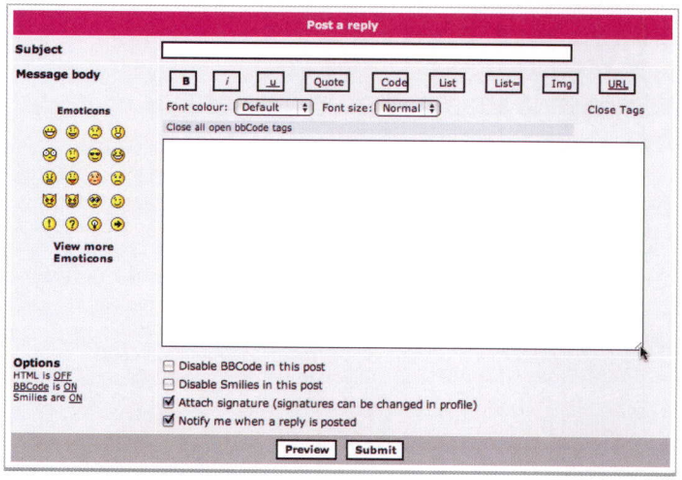
An example of a site that works in any browser you care to shake a stick at is dowebsitesneedtolookexactlythesameineverybrowser.com. Answering the question posed in its URL, its single page (which merely displays 'NO!') offers a slightly different visual design in various browsers. For those with up-to-the-minute support, such as Safari 3, the text has a drop shadow; for those left behind, such as IE6, the PNG has a white background; and on different platforms, the font varies. The point, of course, is that the minimal design remains usable even when stripped of its more fine-tuned, design-oriented elements.



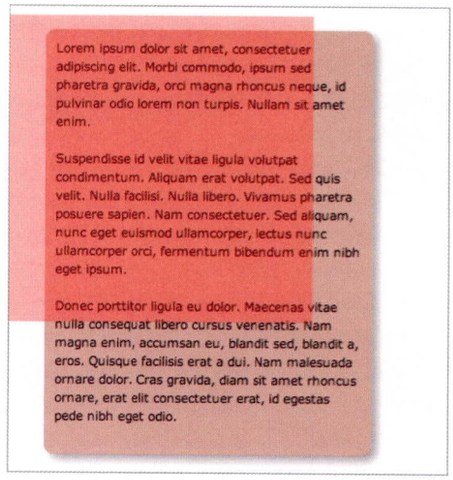
Same difference Clockwise from top left: the one-liner website as it appears in Safari (Mac), Firefox (Mac), Internet Explorer 6 (Windows) and 7 (Windows)

Of course, the various properties mentioned so far for boxes can be combined, so it's easy enough to create a rounded box with a drop shadow. Usefully, the drop shadow conforms to the rounded corners, as you'd expect. An example can be seen in the snappily named **box-with-corners-and-shadow.html** document on the disc, which also highlights another addition to CSS3: opacity. If you open the document in Safari, Firefox or Opera, you'll see a red semi-transparent rectangle overlaying the page's other div. The opacity is defined by the cunningly named **opacity** property; the value range is from 0 to 1 and affects all content within the element it's applied to. Safari and Firefox also enable you to define opacity by using RGBA values (the 'A' standing for alpha), and so you can, for example, define the value **rgba(255, 0, 0, 0.3)** for **background** to create a semi-transparent red background on an object.

While on the subject of backgrounds, one of our favourite additions to CSS3 is the ability to define multiple backgrounds for an element. It's common for web designers to use ugly (from a coding standpoint) hacks to define multiple backgrounds for a web page or a content area, but in CSS3 you can comma-separate background values, thereby enabling you to add and position as many background images as you please. For >>



Left Some browsers, like the depicted Safari, enable you to resize **textarea** elements; CSS3's **resize** property will eventually enable you to define any element as resizable



Right This shot from Safari shows some of the handy new properties for styling boxes. Rounded corners and drop shadows can be applied via CSS, and a box's opacity can be defined

>> example, to position four images, one at each corner of the page's body, you could use the following rule:

```
body {
 margin: 0;
 padding: 0;
 background:
 url(bkg-tl.png) 0 0 no-repeat,
 url(bkg-tr.png) 100% 0 no-repeat,
 url(bkg-br.png) 100% 100% no-repeat,
 url(bkg-bl.png) 0 100% no-repeat;
}
```

Currently, only Safari supports this means of adding backgrounds and an example, **multiple-backgrounds.html**, is on the disc (it requires the four PNG background images referred to in the previous rule).

Perfect positioning

The final property we'll look at is **box-sizing**, which dredges up an age-old argument about the CSS box model. Understanding this model is integral to CSS layouts. If you're not entirely familiar with it, it works something like this: in CSS, you define the dimensions of an element's content area; you can then add to that padding and borders. Therefore, a 100-pixel-wide element with a 10-pixel border will actually take up 120 pixels of horizontal space.

Before version 6, Internet Explorer disagreed, and instead placed borders and padding within the defined dimensions. Eventually, Microsoft relented and the box model was 'fixed' for IE6. The thing is, Microsoft's old way of doing things was actually pretty useful in certain circumstances. For example, create a page with two divs, each with a width of 50 per cent, and float them both left. Now add some padding and a border of a fixed size to each. They'll stack underneath each other, because the combined content width now exceeds 100 per cent. Various workarounds exist: you can define padding and borders in percentages and ensure the sum of all the width values doesn't exceed 100 per cent; you can ensure your div widths don't add to anywhere near 100 per cent (providing space for padding and borders); or you can create nested divs and apply borders and padding to them. However, CSS3 enables you to use the **border-box** property value **box-sizing** to, for specific elements, emulate the box model used by IE 5.5 and before. Currently, Opera uses the property as-is, but Safari and Firefox need the **-webkit-** and **-mox-** prefixes. Ironically, versions 6 and 7 of Internet Explorer don't support this property, although IE8 at the time of writing accepts **-ms-box-sizing**. (See **other-boxes.html** for an example of this property in action.)

And that's not everything CSS3 has to offer. We've mentioned just a subset of the extras you'll (hopefully) soon be able to integrate into websites. As well as the properties mentioned there are, among others, **resize**, which is currently unsupported, but which will enable you to define whether an element's box can be resized by the user; **border-image**, which enables you to define images for element borders, rather than being restricted to a small set of lines and patterns; and the ability to size background images (in Opera and Safari) via **background-size** (using the **-o-** prefix for Opera and **-webkit-** for Safari) and define their point of origin as relative to the edge of an item's padding or content via **background-origin** (which accepts the values **content**, **padding** and **border**).

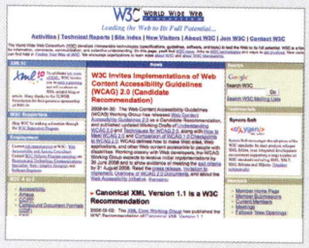
It may seem premature to look at these properties now – as we've said, certain properties only currently work in certain browsers, often also requiring prefixes. However, it pays to know where things are likely to head in the world of web design, and even if you don't consider dabbling in CSS3 getting yourself ahead of the game, it's still fun to experiment and know that you'll be able to bin a whole slew of hacks in the not-too-distant future. ●

1. Donec porttitor ligula
2. Eu dolor
3. Maecenas vitae nulla
4. Consequat libero cursus
5. Venenatis
6. Nam magna enim
7. Accumsan eu
8. Blandit sed
9. Blandit a eros
10. Quisque facilisis
11. Erat a dui

List orders In the not-too-distant future, CSS3 will enable you to automatically display elements in columns: handy for laying out lists of short items

Resources Where to find out more

Css3 Info
Everything you need to know about CSS3 – at least, that's what the strap-line says. To a large extent, it's right: this is an excellent blog for keeping abreast of CSS3 news and information.
css3.info



World Wide Web Consortium
For more information about the CSS3 specification – and, indeed, any of the web specifications that takes your fancy – nip over to the World Wide Web Consortium website, and all will be revealed.
w3.org

About the author

Name Craig Grannell
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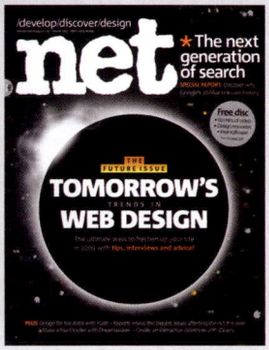
Areas of expertise Information architecture, site concepts
Clients Swim~, Rebellion, IDG
What makes you angry? Things that don't work when they should



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/CSS/create time-sensitive sites

Your essential CD
All the files you'll require for this tutorial can be found on the CD.

Stuart Loxton, web developer at design agency Strawberrysoup (strawberrysoup.co.uk),
explains how to create subtle CSS changes to your site based on time of day

Knowledge needed	Working knowledge of CSS + PHP
Requires	Working test environment with PHP5 enabled
Project time	30 minutes

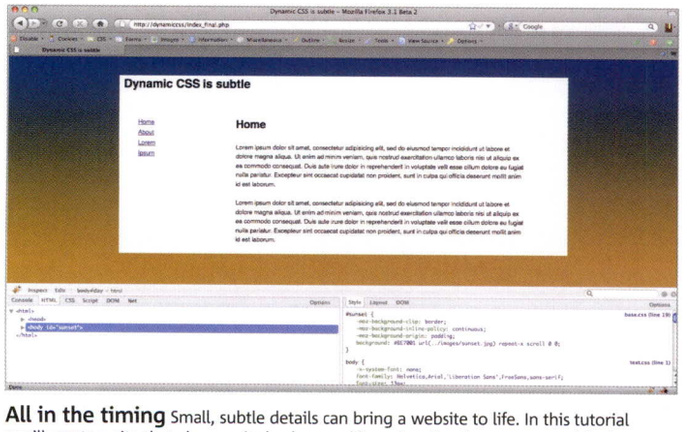
In today's web design environment it takes more and more to attract visitors visually, and even more to make them keep coming back. Of course, this mostly depends on content, but small, subtle details can make any visitor become excited. In this tutorial you'll create a site that changes its background based on the time a person visits it. Afterwards, you should have the knowledge needed to adapt the script to any other data you want to use.

All server-side examples in this tutorial will be based on PHP, so make sure you have a working test environment with PHP5 enabled. If you're using any other server-side scripting tool it's likely there'll be a guide to accomplish a similar effect online. However, reading through this guide you'll probably recognise similar syntax and functions, enabling you to convert it to the language you're using.

Included on the CD is a folder, **tut_css**, that contains all of the base files needed to complete this project. Move the folder into your testing server's root directory. Open it in your preferred IDE and then view **index.php** in a browser. If you've got PHP enabled and everything was copied successfully then you should see a basic white page with a header, navigation on the left and lipsum on the right. It's now time to start the dynamic styles.

PHP sunsets and sunrises

Using PHP to retrieve and make decisions based on time has its advantages and disadvantages. The largest disadvantage is the fact that PHP can't access the user's computer's time and can only get the time of the server. The advantage is that PHP has a large set of functions that make dealing with time that little less painful. Open up **index.php** and, before the start **<html>** tag, type the following PHP. Afterwards, I'll explain the key parts of the script.



All in the timing Small, subtle details can bring a website to life. In this tutorial you'll create a site that changes its background based on the time a person visits it

```
<?php
  $time = date('G');
  $sunrise = date_sunrise(time(), SUNFUNCS_RET_DOUBLE);
  $sunset = date_sunset(time(), SUNFUNCS_RET_DOUBLE) + 1;
  if($time >= $sunrise && $time < $sunrise + 2) $style = 'sunrise';
  elseif($time >= $sunrise + 2 && $time < $sunset) $style = 'day';
  elseif($time >= $sunset && $time < $sunset + 2) $style = 'sunset';
  else $style = 'night';
?>
```

Lines 2-4 set three variables. **$time** is set to the current hour. **$sunrise** is set to the sunrise time for today. **$sunset** is set to one hour later than the sunset time. From my experience, official sunset times start an hour or two before what most people would call sunset starts.

Lines 5-8 run a set of standard **if** statements to determine which style to show: sunrise, day, sunset or night. This is then set to the variable **$style**. This can now be used whenever a reference to the time of day is needed, as I'll show below.

There are three main ways to having dynamic CSS. Which one you use depends on several factors: the number of styles that change per data; the number of style sheets that get loaded into the page, and the amount of customisation you have on your server.

You'll create a site that changes its background based on the time a person visits it

1) Setting a body id/class: The most popular method of using dynamic CSS is to set the body id or class of the page depending on the styles needed. The advantage of this is that no server changes need to be made: you can use the same id/class across style sheets with no extra code and it's easy to quickly prototype and debug. The disadvantage of this is that you can only use pre-defined constants. Because of this you can't have random colour palettes using this method.

2) Including style sheets: The second most popular method is to include extra style sheets depending on which styles you need. This can be beneficial when a lot of styles change depending on what's needed; this stops the style sheet having to include styles for all other possible states of the site together. The disadvantage is that you have to create a style sheet per state. This can be a big hassle if you're going to have a lot of different styles. It also inherits the flaw of not being able to access the data in the style sheet.

3) PHP in the style sheet: This approach can be done in several ways. When used successfully and appropriately, it can create the largest amount of freedom. With data being directly accessible in the style sheet, there's no limit to the amount of states possible. The disadvantage is that if you want your style sheets to still have the .css file extension you need to customise the server; this also means you lose the portability of the style sheet. The other

option is to use .php as the CSS extension. Another disadvantage is that you're limited to having all the rules in one file without having to duplicate and reprocess the PHP.

In our example there are only a few things changing per state and there are only four states. Based on the advantages and disadvantages outlined above, setting a body id is probably the best way of achieving the effect.

Change the **<body>** tag to the following:

```
<body id="<?=$style?>>
```

Then open **base.css** and add the following to the end of the file.

```
/********** TIME SENSITIVE CSS **********/
#sunset {
background: url('../images/sunset.jpg') repeat-x #BE7001;
}
#sunrise {
background: url('../images/sunrise.jpg') repeat-x #EFC501;
}
#day {
background: url('../images/day.jpg') repeat-x #0A6FBF;
}
#night {
background: url('../images/night.jpg') repeat-x #00123A;
}
```

Open your page in a browser now and admire the scenery, depending on what time of day it is.

Including style sheets is another simple yet effective method. The practice involves having a separate style sheet for each state. To adapt the current site to use this method, create four style sheets called **sunset.css**, **sunrise.css**, **day.css** and **night.css**. Place the appropriate code for each state in its file, then remove the id on the body tag and instead place the following code in the **<head>** tag.

```
<link rel="stylesheet" href="css/<?=$style?>.css" type="text/css"
media="screen" charset="utf-8" />
```

Out of the three methods outlined this one is by far the most flexible and powerful. However, it also requires the most work, so if a stage doesn't work for you, go back and repeat again. If it still isn't working as it should then a quick search online will normally lead you to a solution to the same problem someone else had.

Setting .css to be run as php

This is a matter of personal opinion; however, I feel that having a .css extension helps define what an external asset is doing. This stage isn't required, so if you don't mind having CSS with the .php ending, or your server doesn't allow you to make the following changes, then skip this step.

Taking it further

Your next steps in dynamic CSS

Dynamic CSS isn't restricted to simple time and date manipulations: any data that your server or client's browser can access can be used. Whether it's pre-determined states such as seasons or based on data hosted elsewhere, here are a few extra ideas.

Location

Retrieving the visitor's location is a tricky thing, although there are several popular libraries and snippets readily available to make things easier. Mozilla is also pioneering the methods in which a server and site can detect a user's location. Having the background change to complement your location could be an easy way to make your site more localised.

Weather

Having your site's background change depending on the weather could add function as well as design to a site. Visitors to a local harbour could quickly determine the current weather or water height before even getting to the page.

RSS Feeds

Easily accessible and retrievable RSS feeds now span the spectrum of content on the web. Colour palettes, political data, surveys and pretty much anything you could want is probably already in RSS format.

Local site data

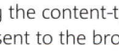
If your site has dynamic content, why not complement it with some dynamic styles? If you have a blog then you could have the background represent the category that was last blogged about.

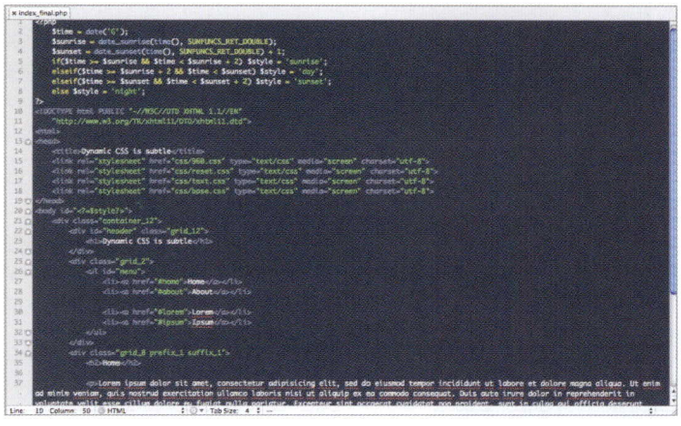
Create a .htaccess file in the root of your site and place the following line in it:

```
AddHandler application/x-httpd-php .css
```

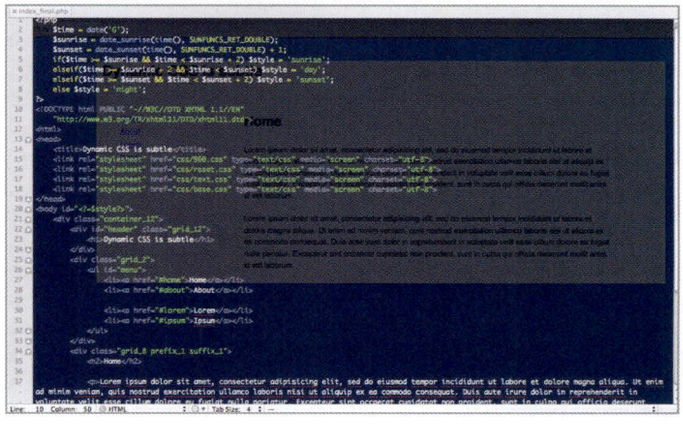
This sets PHP to handle all files with a .css extension, enabling you to place php in a .css file as if it were exactly the same as a .php file. If it fails to do anything at first, restart Apache and see if that solves the problem.

Setting the content-type

The most important thing to do when using dynamic CSS is to stop PHP setting the content-type header as **text/html**. You need your CSS files to be sent to the browser with the content-type **text/css**. To do this, 



Pros and cons PHP can't access the user's computer's time, but on the plus side it has a large set of functions that make dealing with time a little less painful



Go further The code in this tutorial changes the background according to time; the same technique can be used to adapt to location or weather

Sunny disposition Strawberrysoup's site for Oasis Overland (www.oasisoverland.co.uk) will feature a dynamic background that changes depending on the time of day

Sky's the limit This time-sensitive background fits in nicely with the adventure travel specialist's ethos and enhances the website's appeal to its target market

>> place the following line at the top of **base.css** (or **base.php** if you didn't complete the previous step).

```
<?php header('Content-Type: text/css'); ?>
```

To get the background to change now, place this just below the line you just wrote at the top (you can remove all the PHP from the **index.php**).

```
<?php
  $time = date('G');
  $sunrise = date_sunrise(time(), SUNFUNCS_RET_DOUBLE);
  $sunset = date_sunset(time(), SUNFUNCS_RET_DOUBLE) + 1;
  if($time >= $sunrise && $time < $sunrise + 2) $style = 'url(../images/
sunrise_bg.jpeg) repeat-x orange';
  elseif($time >= $sunrise + 2 && $time < $sunset) $style = 'url(../images/
day_bg.jpeg) repeat-x blue';
  elseif($time >= $sunset && $time < $sunset + 2) $style = 'url(../images/
sunset_bg.jpeg) repeat-x black';
  else $style = 'url(../images/night_bg.jpeg) repeat-x black';
?>
body {
background: <?=$style?>;
}
```

Opening the page in a browser should now show you a background simulating the great outdoors.

PHP isn't the only way to add dynamic elements in your sites: JavaScript has been the raw base to site dynamics for years. Of the three methods above, the first two will work fine in JavaScript with adaptations. JavaScript has a few disadvantages. There's a delay between page load and the new styles. JavaScript is also notorious for browser differences, and it doesn't have the same resources as PHP, so can't provide sunrise and sunset times. For this reason, in the examples below the state will be statically set to **day**.

```
var state = 'day';
document.getElementsByTagName('body')[0].id = state;
```

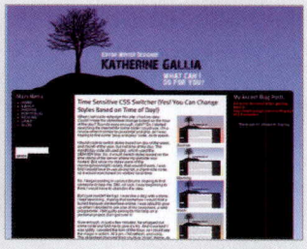
A general breakdown of the code above is that it assigns the variable state a value of **day**. The second line then starts by selecting the document, finds all the elements with the tag name **body** (should always be just one) and then gives the first (0 nth element) the id of **state**.

```
var state = 'day';
var cssFile = 'css/' + state + '.css';
var link = document.createElement('link');
link.setAttribute('href', cssFile);
document.getElementsByTagName('head')[0].
appendChild(link);
```

Based on the three PHP methods demoed here, there are a number of different ways you can make your CSS dynamic. If you need more ideas, though, just see the Taking it Further box on the previous page. ●

Resources Time-sensitive sites

Taproot Creative
This agency's website utilises two style sheets, day and night. The added touch of seeing the site's colours change gives a nice touch of personality.
taprootcreative.com



Katgal.com
One of the earliest examples of time-sensitive switchers was on katgal.com. The new design doesn't have it but the example is still live at the URL below.
katgal.com/styleswitcher.htm

About the author

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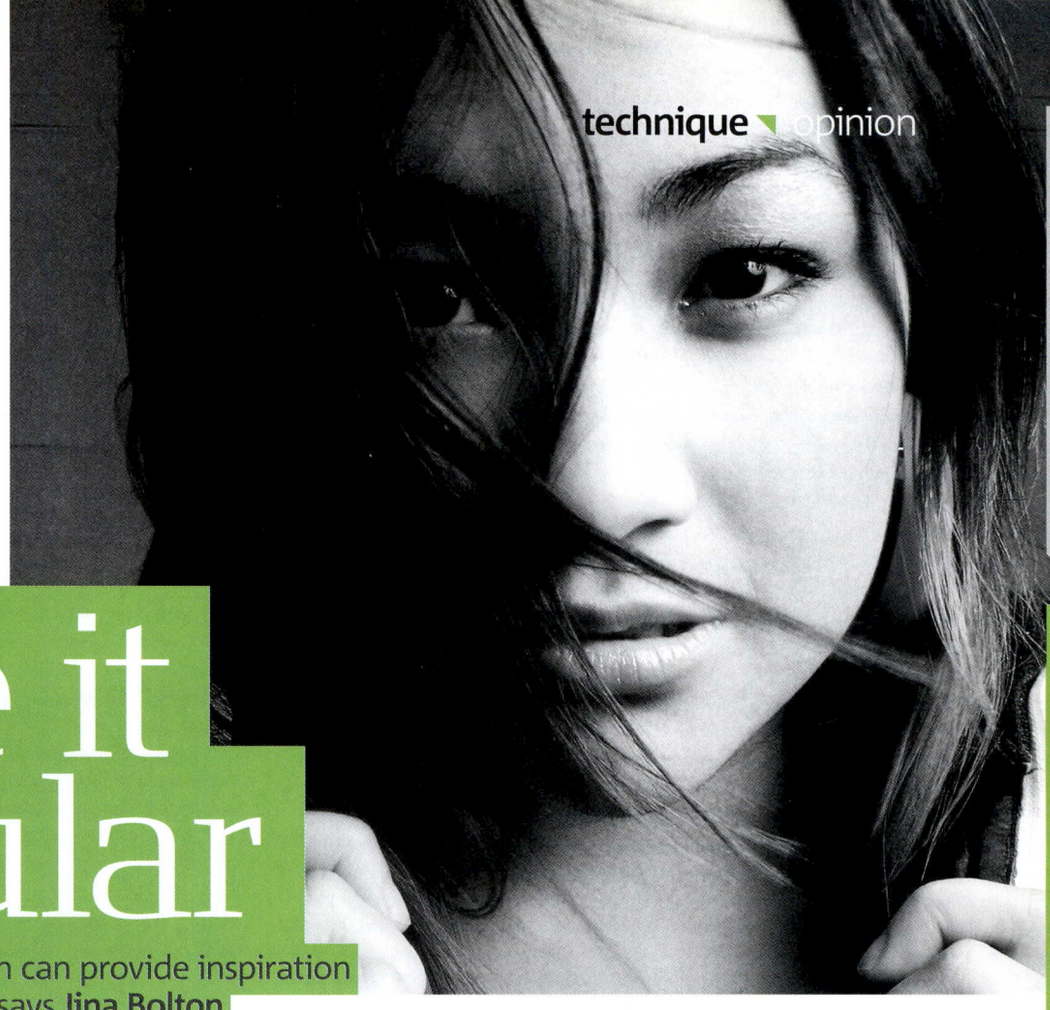
Clients Mike and Ike, BUPA, West Sussex County Council
Who would play you in a movie? Mike Myers



Jina Bolton on...

Make it modular

Minimalism and modular design can provide inspiration for modern web development, says **Jina Bolton**

Some people look at web development as engineering. Personally, I like to see it as web "production design". In film, a production designer brings the script alive, using a strong sense of space, time, mood and texture. In graphic design, the production designer takes an idea to execution, by creating prototypes and determining techniques and materials. In both scenarios, there's one underlying goal: bringing a concept to life. A web production designer would be the person who takes the designs and turns them into interactive reality.

I enjoy thinking of my work as design and I like to look to certain design themes to improve it. There are two themes I'm a fan of when it comes to design: minimalism and modular design. Each includes aspects of great-looking design that I find attractive, practical and useful. If you're applying both concepts to development, your markup and CSS can be effective and maintainable. I like to think of this markup and CSS as "well-designed".

> "Modular design and minimalism help to make work more manageable and efficient" Jina Bolton

Minimalism is an ongoing trend in design, and in web production design, we strive to simplify. In an ideal world, every site would use the most minimal, yet meaningful, semantic markup available. In the real world, however, some sites require an additional, practical approach. If you're developing for a dynamic, large-scale enterprise site, you can potentially be more efficient when you consider the advantages of modular design.

Designed for life

Modular design involves breaking an object down into smaller parts, or modules, which can be developed individually and are often used to perform different functions outside the object as a whole. It's a theme you'll find in many architecture, interior design and industrial design publications. The term is usually applied to tangible objects that are created to offer customisation in a "plug-and-play" or "mix-and-match" manner. The goal is to offer more usability and reusability, and to save materials and money.

In furniture, a sectional sofa is a great example of modular design. Pieces of furniture fit together to create a large seating area. These pieces can be moved in different configurations to create a layout for seating or, alternatively, can be separated to become stand-alone pieces. These pieces can even go into different locations, so the couch can be in the living room and the ottoman in another part of the house. This enables the individual to use the pieces in the way that's most beneficial to them: if their needs change, they can reposition them to suit that change.

So, how does this relate to web development? Take a news site, for example. A list of top-rated stories may appear on the homepage, big and bold, in a centre column. That same list of stories may also be visible in a search results or archives page in a right-hand side column, where they appear smaller and more subtle. The markup for these stories could be an unordered list of linked story titles. We can use the same markup for both lists and then, by using descendant selectors, we can give each list its unique styling depending on where it lands on a page (or even depending on which page it lands on).

Another example is a commercial site, where this type of design can be useful for products that appear throughout the site. Whether the product appears in a "new products" section, a search results page or a "related products" section, the markup for that product can be the same.

When I'm inspired by modular design and minimalism, and I apply these concepts to web production design, I find it can help to make work more manageable and efficient. Pieces of the site are reusable, which can save time on development. Simplifying the markup and CSS, where possible, also makes development maintainable and easier to edit over time. In the end, not only can we have a well-designed site, but the way in which it was built can be well-designed, too. ●

Jina Bolton (jinabolton.com) is a designer, artist, developer, speaker and co-author of The Art and Science of CSS. *She works and resides in Silicon Valley, and is currently learning Italian.*

/CSS/integrate your images into grids

Craig Grannell looks at the difficulties of working with grid-based layouts that include images and columns – and comes up with some simple solutions

Your essential CD
All the files you'll require for this tutorial can be found on the CD.

Knowledge needed Intermediate CSS and HTML

Requires A text editor

Project time 20 minutes

As anyone who's worked with grids probably knows, images can merrily wreak havoc on a grid-based layout. This tutorial, therefore, looks at integrating images (and also columns) into a strict grid-based structure.

Two methods are provided: one for an entirely pixel-based layout, and another for a flexible grid.

You may have just read 'entirely pixel-based layout' and wondered how far that goes. The answer is – all the way. You might not realise it, but we're actually in the middle of another switch in the way fonts are dealt with on-screen – one that could prove controversial in some quarters, and therefore probably won't become ubiquitous for a while.

Return of the pixel

In the past many web designers, coming from print backgrounds, used points (pt) to size fonts. They were duly given a slap and began using pixels (px), which was great until it arose that Internet Explorer wouldn't zoom fonts sized that way. Designers worldwide sighed, swore at Microsoft and started arguing about a solution.

In the end, most went with a combination of percentages and ems, setting a 'baseline' size of 62.5 per cent and then using ems a tenth of the target pixel size to size fonts. For a while, everyone was almost happy.

Now, however, a combination of factors are causing a rethink regarding font sizing. The most important is the way in which three of the four major browsers – Internet Explorer, Firefox and Opera – now deal with zooming. Rather than merely zooming text, these browsers now offer a full-screen zoom by default (although Firefox and Internet Explorer continue to offer text-only zooming as a legacy method). This means that if you find the onscreen content a wee bit small, everything can be zoomed – including images. Assuming Safari follows suit (which will mean Google's Chrome should do as well), cunning trickery to size fonts will become pretty much redundant. Note that mobile devices such as the iPhone also make use of full-screen zooming, and they're likely to rapidly increase in popularity over the coming months.

Expert tip Aim for imperfection

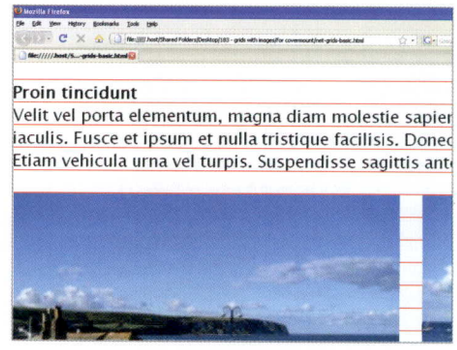
When working on grid-orientated designs, don't go crazy making sure every part of every page in every browser adheres 100 per cent strictly to the grid. Imperfection across the board is likely, due to rounding errors with some browsers (Safari is particularly notorious for this when using ems). With designs where this causes major visual snafus, try using CSS overrides for particularly obvious issues, but otherwise just get on with your life, rather than fine-tuning everything to the 'nth' degree, even if this involves a little visual compromise.

Full-screen zoom means that everything can be zoomed – including images

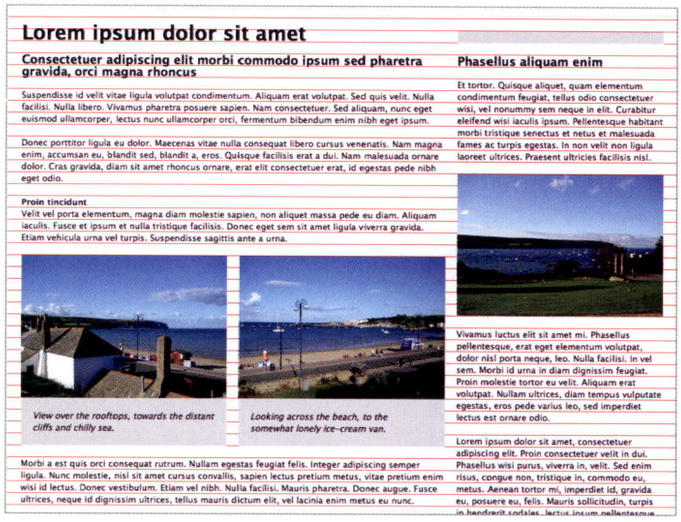
The basic grid

On the CD, the files **net-grids-basic.html**, **net-grids-basic.css** and their associated images form the first of the layouts. This is a very strict grid-based web page, using a 12-column structure. (In the design, the main content area spans eight columns and the sidebar spans four.) The baseline

Left With the pixel-based method, the grid breaks in browsers that don't have a full-page zoom, because only the text changes size



Right The latest version of Firefox, along with Internet Explorer 7 and Opera, has a full-page zoom, rather than just zooming text



Uniformity Here's the website built for this tutorial, with the baseline grid turned on. Note how the gutters use the same measurement as the grid, ensuring uniformity

grid measurement is 18px, and that value is used for other important measurements on the page, such as column gutters, in order to provide a real sense of uniformity.

Structurally, the HTML is pretty straightforward, as all the best HTML should be. A **wrapper** contains the layout, and nested within this are divs for the main content and sidebar, which you'll find have **id** values of **mainContent** and **sidebar**, respectively.

The main content area has three levels of headings, a bunch of paragraphs and a couple of columns with images in that have associated captions on a grey background. The sidebar has a heading, some paragraphs and an image of its own. It also has a thick, grey border top and bottom, and this helps the eye see the area as a distinct block. Without these borders, the sidebar becomes less prominent and it's much more likely that the eye will flit between the main content and the sidebar, which isn't what you want in this kind of design.

When it comes to imagery and other decorative content, it's imperative that they stick rigidly to the baseline grid. For the text in this example, this was child's play. With the fonts being sized in pixels, a **line-height** value of 18px declared in the **body** rule of **net-grids-basic.css** ensures the text adheres to the grid. For the one element that needs a larger leading value – the main heading – a multiple of 18px is used.

For the borders, it's logical to define them as 18px high, thereby ensuring the vertical rhythm is maintained throughout the page. Should these values be reduced, top and bottom padding and/or margins within the sidebar would have to be increased to compensate. With inline images, two things need doing: first, they must have a height that's a multiple of the baseline grid value – in the examples shown, the images are 216px high, which is 12×18. Second, with images being inline elements that allow space beneath for a text string's descenders, the images must also be set to display as block elements (see **#sidebar img**, **.photoColumn img** in the CSS).

Code-wise, it's probably also worth noting how the photo columns work. The mark-up for these is a containing div for the entire block, housing a containing div (floated left) for each column.

```
<div class="photoColumnContainer ">
<div class="photoColumn">
[column content]
</div>
<div class="photoColumn">
[column content]
</div>
</div>
```

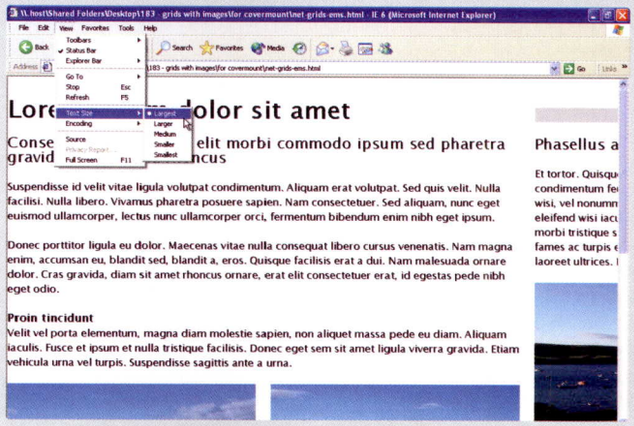
The width of each **photoColumn** div is 310px, and a **margin-right** value of 18px has been defined to create the gutters. However, this combines

Legacy browsers

Dealing with Internet Explorer 6

At the time of writing, Internet Explorer 6 still commands a depressingly high market share – something in the region of 25 per cent. Clearly, it's not going anywhere fast and unless your target audience is known to be relatively IE6-free (as in, usage being well under 10 per cent), it's got to be taken into account.

For grid-based layouts that are carefully constructed, IE6 largely behaves, but it does do a couple of things that warrant mentioning. The first is that it doesn't tend to deal well with floated elements whose content areas and margins exceed the available space. The solution is generally to set **overflow: hidden** on relevant containing divs, as shown in each example's IE6-specific style sheet. The second issue is that prior to version 7, IE was prone to rounding errors when using ems. In the second example, this was fixed by dropping the **width** value of **.photoColumn** by 0.01em.



Conditional comments IE6 will be with us for a while yet, and so fixes via conditional comments will remain commonplace for another year or two

to a value of 656px, 18px wider than the **mainContent** div's width setting. With nothing further done, the **photoColumn** divs sit one under the other. However, by placing them within a container and explicitly setting its width to the full value required by the two columns and their margins, the columns sit side-by-side. In compliant browsers, the overflow sticks out of the side of the containing **mainContent** div (which makes no odds in this layout, what with the overflow merely being a right-hand margin); in IE6, some tweaks are

When it comes to imagery, it's imperative that it sticks rigidly to the baseline grid

needed, but they're simple enough – see 'Legacy browsers' above for more detailed information.

The flexible grid

This first layout works much like you'd expect in the browsers that do full-page zooming, and shows where the future likely lies for grid-based layouts and the resurgence of pixels. However, two potential spanners in the works are Internet Explorer 6, which sits there like a lemon when you try to resize text, and Safari (along with other WebKit browsers), which happily resizes the text but nothing else. In usability terms, the second issue makes no odds, but the grid is broken unless Safari's at its default zoom level. For design purists, this is likely to be enough to send them into a Hulk-style frenzy >>

(Hoxton, beware!), hence the idea of working with some sort of back-up method: the flexible grid.

The filenames for the second method's web documents, **net-grids-ems.html** and **net-grids-ems.css**, should give some indication of how everything works. Yes, we're back to the 62.5 per cent method, with ems being used to define box dimensions and font sizes. Once this is done, the basic layout of the page still zooms as you'd expect in full page zoom-enabled browsers, but this time users of Safari and older versions of Internet Explorer can also zoom in this fashion.

Because the dimensions of images are defined in pixels, however, the grid breaks once the page is zoomed, like the previous version broke in Safari. Therefore, short of defining image sizes in CSS (which would inevitably lead to distorted images when the page is zoomed), we need a cunning workaround. Said solution is a bit of a hack, but it works well enough. To begin, another set of images is required, each with their dimensions roughly double that of those used previously. Each **img** element then needs to be nested within a div that has a **class** value of **photoContainer** and a second class value specific to the photo. Below is the code used for the sidebar's image.

```
<div class="photoContainer sidebarPhoto">
<img src="photo-sidebar-216.jpg" alt="Photo of park" width="310" height="216" />
</div>
```

When using CSS, the way the image can be presented is controlled by three different rules.

```
.photoContainer {
overflow: hidden;
margin-bottom: 1.8em;
height: 21.6em;
}
.sidebarPhoto {
background: url(photo-sidebar-600.jpg) 50% 60% no-repeat;
}
#sidebar img, .photoColumn img {
display: block;
margin-left: -310px;
margin-bottom: 1.8em;
```

The **.photoContainer** rule provides a height for the photo container and crops overflow via **overflow: hidden**. The **.sidebarPhoto** rule is the one specific to the image, and this defines the source of the larger version of the picture, along with its positioning within the crop area.

The **#sidebar img, .photoColumn img** rule uses a negative left margin to pull the **img** elements outside the visible area of their containers. The upshot is that for standard browsers the enlarged images are shown as backgrounds on the containing divs, but for browsers with no CSS support, the original images are still available.

Above While the flexible layout zooms as expected in Safari, maintaining the page's grid and vertical rhythm, this method means that all your images begin cropped

Combined methodology

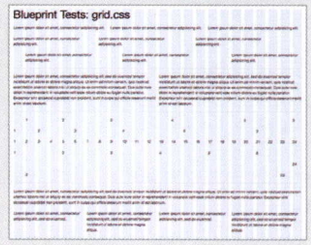
The advantage of this method is that all browsers now zoom the page in the same way, and the images also zoom in the likes of Safari and Internet Explorer 6, ensuring the page's grid and vertical rhythm is always maintained. The negative aspect of the flexible grid and the image 'hack' is that you only initially see a crop of your images, rather than the entire thing. Although what you see can be controlled somewhat via the **horizontal-position** and **vertical-position** values in CSS (shown only as percentages in the shorthand **background** rule of **.sidebarPhoto** earlier in this tutorial), this might be a compromise too far for some designers.

Of course, web design is often about compromise, and so with grid design that utilises imagery, you have to make a decision before you begin. Are you content to work with a pixel-based layout, looking forwards, but in the knowledge that WebKit browsers can't do a full-page zoom, and that Internet Explorer 6 users won't be able to resize your page at all? Or would you prefer to work with a flexible grid, which not only brings compromises when images also scale, but forces complexity in the way values are calculated for font sizing and line-height?

Savvy designers might have twigged that there are other options, formed by some kind of combination of the methods outlined in this tutorial. You could, for example, start with the pixel-based method as your baseline, and then by way of conditional comments serve flexible grid values for some or all of the box and image elements for Internet Explorer 6. Likewise, you can use JavaScript to serve some CSS over-rides for Safari if you decide you can't live with it breaking the grid when zooming text. Sure, you'll end up with a little semi-redundant code around a few images, but the end result will still be smart and compliant, and the baseline CSS will be suitable going forwards – well, assuming some bright spark doesn't figure out an even better way of sizing boxes and fonts in CSS. ●

Resources Learn more about grid layouts

Grid layout primers
If you've just read through this article and are making lots of 'bwa?' and 'whuh?' noises, check out your correspondent's grid articles on Dev.Opera for a grounding in the methodology.
dev.opera.com/author/1525117



Blueprint
If you're in a major hurry, but are still keen to get a grid layout up and running, Blueprint makes a good starting point, although learning the hard way is perhaps more beneficial.
blueprintcss.org

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Clients Swim~, Rebellion, IDG
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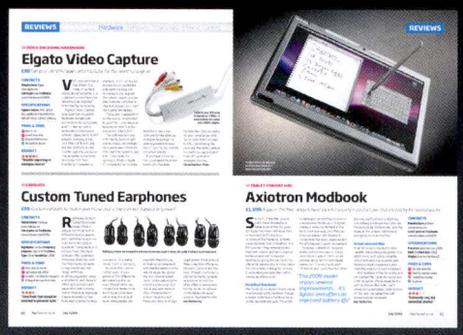

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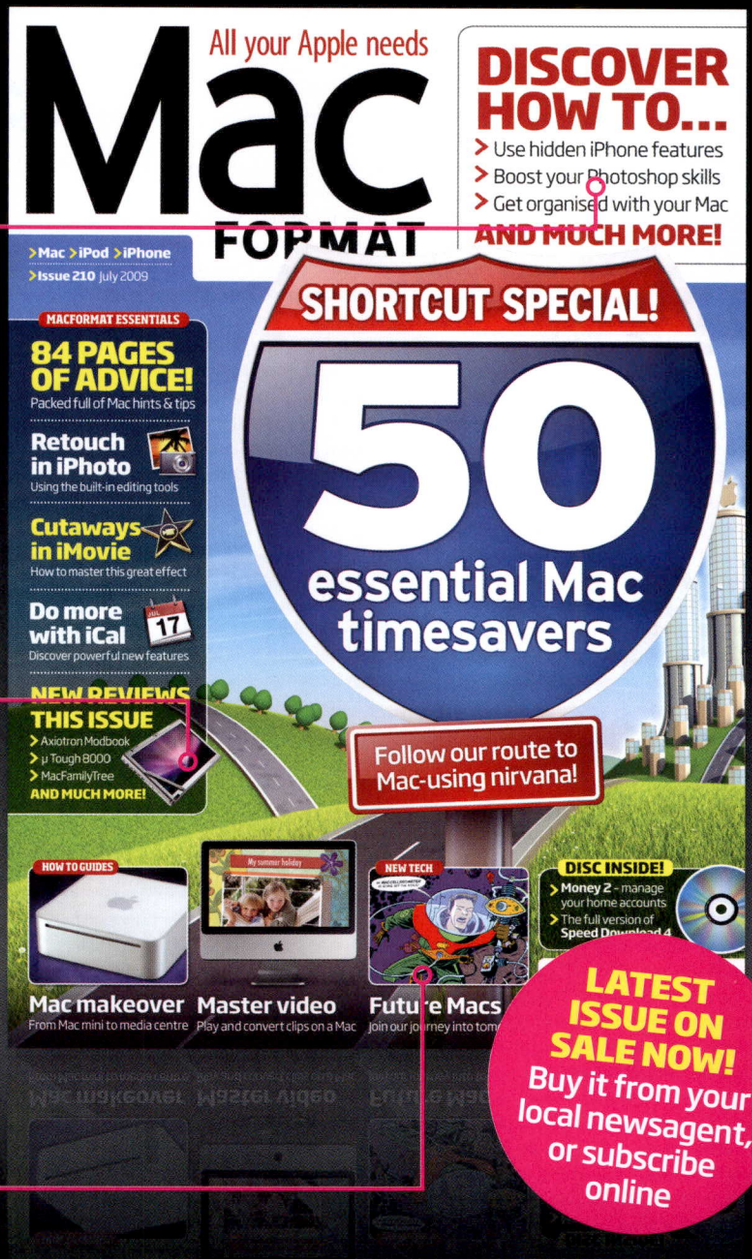

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/CSS/version control with Subversion

Your essential CD
All the files you'll require for this tutorial can be found on the CD.

Where would we be without the ability to undo our mistakes? **Gavin Montague** shows how your projects can benefit from an undo feature that puts Ctrl-Z to shame

Knowledge needed A little HTML and CSS
Requires Free to download Subversion tools
Project time One hour

Subversion is a free, open source tool produced by CollabNet Inc and distributed from subversion.tigris.org. It's used to manage the source for Apache, Python, Django and literally thousands of other projects, large and small. In fact, I'm using Subversion to track the changes to this very article as I write it.

You can think of Subversion as working like a file server. A nominated directory, called the repository, holds a master copy of the project. Anyone making alterations to the project must first check out a copy to work on. With their alterations complete, the changes are committed back to the repository where they become visible to other collaborators. Nothing fancy so far, but where it gets interesting is that Subversion doesn't just store the current state of the files; it records every commit along with a note describing what the change was and who made it.

If everyone can edit their working copies and commit back to the repository, what happens when the changes are in conflict? If Steve and Bill are both editing index.html, what happens when Steve commits his changes and Bill tries to commit his changes a few minutes later?

Subversion has a good answer to this: it will refuse to add any of Bill's changes to the repository until Steve's edits have been merged into his working copy. If the changes don't clash (say Steve was editing the document head and Bill was making changes to the text in the footer) Subversion will silently add Steve's changes into Bill's working copy. If any changes overlap, Subversion will ask for Bill's help in merging Steve's alterations. After bringing his working copy up to date, Bill is free to commit to the repository.

Subversion assigns each commit an incremental stamp. The first import is assigned number 1; the next set of changes make the project into revision 2, and so on. This makes it easy to check whether your working copy is up to date. If the repository is at revision 15 and your working copy is on revision 12, then three commits must have been made since you last updated. You can use the commit numbers to ask for older copies of files: 'Show me how the style sheet looked at revision 5'.

Alternatively, you can use dates to phrase the question: 'Show me how the homepage looked two weeks ago.'

This all boils down to a four-step workflow:

1. Check out a working copy from the repository.
2. Make your alterations; add, delete and edit files.
3. Merge recent changes from the repository into your working copy.
4. Commit your changes back to the repository.

We've covered a lot of ground in this section. Don't worry if it all seems a bit abstract.

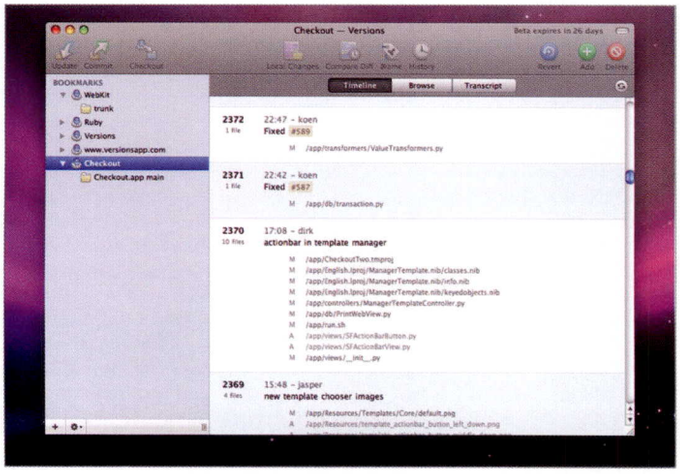
There's a glossary of the most important and commonly used terms on the facing page (top right) and we're going to run through some of the practical benefits Subversion gives us by working on a hot Web 3.0 dot-com. The files you'll need can be found on the disc.

Expert tip Don't save up your commits

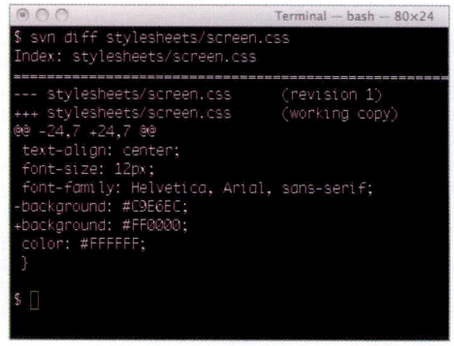
Subversion only takes snapshots of your project when you commit back to the repository. Don't work for a whole day and then bundle up all your changes in a single commit just before you go home. Commit each time you complete a discrete task and add a descriptive comment that will be meaningful at a later date. 'Updated descriptions on product pages with correct SKU code' is an example of a good commit message. 'Fixed some bugs and added new stuff' is not.

Installing Subversion

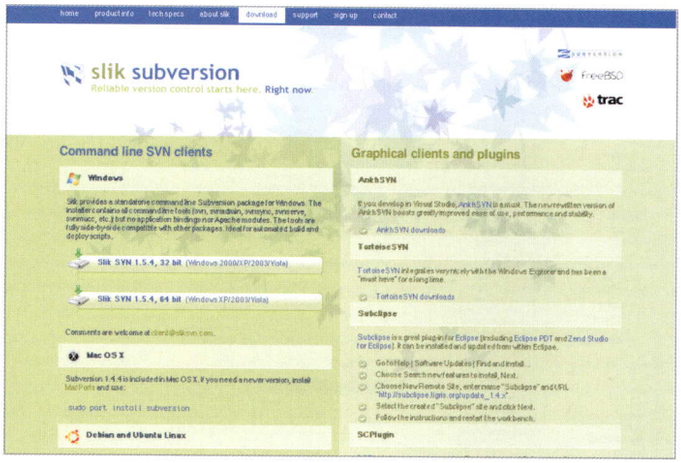
Subversion is available for Windows, OS X and Linux, so everyone will be able to play along. The bad news is that we'll be using the command line interface in this tutorial. You might not be familiar with the command line, which we'll call the 'prompt' from now on, but it's the best way of learning the underlying



Left Open source version control system Subversion enables you to keep track of changes to your project. It records every commit along with a note describing what the change was and who made it



Right You can use the diff command to get more details about the changes that have been made to a particular file



Slik service If you're using Subversion on Windows you can install the Command Line Client SVN tools from Slik (www.sliksvn.com/en/download)

concepts of version control. Once you're happy with what's happening, you can graduate to any of the graphical front-ends.

For Windows, install the Command Line Client SVN tools from Slik (www.sliksvn.com/en/download). Once it's installed, you can bring up the DOS prompt by clicking on the **Start** menu, selecting **Run** and then typing **cmd** into the **Run this program** field.

You can ask for older copies of files: 'Show me how the style sheet looked at revision 5'

Subversion has come pre-installed with OS X since 10.4. For earlier versions, Martin Ott maintains a Subversion package (homepage.mac.com/martinott/). Once installed, open the **Terminal** prompt by launching **Applications > Utilities > Terminal.app**.

For Linux, refer to the instructions for your package manager. It's likely that you'll be able to install Subversion easily.

In the code samples below, the lines of input are prefixed with a $ sign. Depending on your system, the $ sign might be replaced with your username or the path to the current directory.

Lines that don't have a dollar show the generated output. For example, to confirm Subversion is installed, type the following at the prompt:

```
$ svn
Type 'svn help' for usage
```

Here svn is your line of input. Pressing enter will generate the output **Type 'svn help' for usage**.

Detailed help on all the commands we use below can be accessed by appending the command name after **help**. For example:

```
$ svn help checkout
```

Expert tip Graphical interfaces to svn

Although we've been using the command line in this tutorial, Subversion also supports a range of graphical front-ends that enable you to manage repositories and working copies from within a normal desktop application. On a Mac you might like to try Versions (versionsapp.com/) or svnX (www.lachoseinteractive.net/en/community/subversion/svnx/features/) while on Windows, TortoiseSVN (tortoisesvn.tigris.org/) integrates directly into your File Explorer.

Glossary

Like all software, Subversion comes with its own terminology: here's our guide

Repository The database that retains the master copy, and history, of your project.
Check out To connect to the repository and make a local working copy of the project
Working copy The local version of the project in which edits are made
Commit To write changes from your working copy back to the repository
Update Pulling changes from the repository into your working copy
Merge When changes in your working copy can be silently combined with changes in the repository
Conflict Two changes between your working copy and the repository that Subversion cannot resolve and required manual intervention.

Setting up your repository

Create a new folder on your desktop called **svn_tutorial** and move the prompt into it with the **cd** (Change Directory) command and then create an empty repository:

```
$ cd Desktop/svn_tutorial
$ svnadmin create repository
```

You'll now see the folder repository appear inside **svn_tutorial**. This is the database that will store the master copy of our project; you'll never use these files directly, but it's good to know they exist.

Copy the folder **emailr** from the disc into **svn_tutorial**. We'll now import it into the repository for Subversion to track. You'll need to give the full path to the repository folder so the command will vary between systems. On Windows, it'll look like this:

```
$ svn import emailr "file:///C:/Documents and Settings/<your user name>/
Desktop/svn_tutorial/repository" -m "Imported the starter project into the
repository"
```

And on a Mac the command will be:

```
$ svn import emailr "file:///Users/<your user name>/Desktop/svn_tutorial/
repository" -m "Imported the starter project into the repository"
```

Subversion will reply by listing the files added to the repository. The final portion of the command, from -m onwards, is the commit comment. We'll look at how to access these later.

Our repository is now set up and we can check out a working copy called **dev_copy**. Windows users do this with the command:

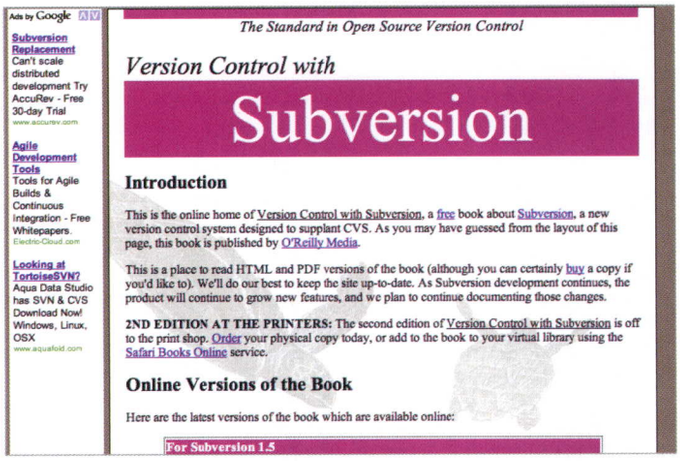
```
$ svn checkout "file:///C:/Documents and Settings/<your user name>/
Desktop/svn_tutorial/repository" dev_copy
```

And for the Mac users:

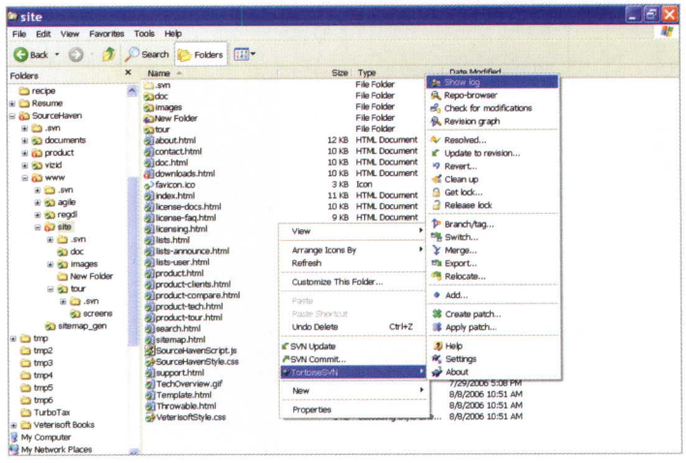
```
$ svn checkout "file:///Users/<your user name>/Desktop/svn_tutorial/
repository" dev_copy
```

A folder called **dev_copy** will appear. We won't have to give the long path to the repository again. Our working copy will automatically find its repository. We also no longer need the original copy of **emailr**, so that can be deleted.

It's worth noting that although we're keeping our repository and our working copy on the same computer, Subversion can use a whole range of network protocols to communicate with remote repositories via ssh, http and its own svn protocol. Keeping your repository off-site can give you a higher level of security and allow for easier collaboration. >>



Learn online If you want to find out more about using Subversion, the book *Version Control with Subversion* is available to download for free at svnbook.red-bean.com



Tortoise time Subversion supports a range of graphical front-ends, such as TortoiseSVN (tortoisesvn.tigris.org), which integrates directly into your File Explorer in Windows

Your first edit

Time to start using Subversion on our site: a cutting edge, paradigm-shifting Web 3.0 email tool. We'll only be dealing with the HTML and JavaScript parts in this version.

The first thing we'll do is update the background colour of the page in **screen.css** to match the new company branding – replace **#C9E6EC** with **#FF0000**.

After saving the file, move the prompt into **dev_copy with cd** and ask Subversion to look over the working copy for changes.

```
$ cd dev_copy
$ svn status.
m  stylesheets/screen.css
```

The **m** indicates that the file has been modified. We'll see other possible markers representing the state of files later. To get more details on the changes to a particular file, use the diff command:

```
$ svn diff screen.css
Index: stylesheets/screen.css
===================================================================
--- stylesheets/screen.css  (revision 1)
+++ stylesheets/screen.css  (working copy)
@@ -24,7 +24,7 @@ text-align: center;
font-size: 12px;
font-family: Helvetica, Arial, sans-serif;
-background: #c9e6ec;
+background: #FF0000;
color: #FFFFFF;
}
```

This format is called 'unified diff' and is often used by developers to exchange patches of code via email, IM and the web. There are tools for automatically applying patches, but the format is rather readable and will serve us well here. Lines beginning with a + show insertions. Lines with a - show deletions. As you can see, we've removed the line containing the old background colour and inserted a line containing the new one.

```
$ svn commit -m 'Changed the background colour of the page to match our new corporate identity'
```

The working copy sends its changes to the repository to be committed. Run **svn status** and you'll notice Subversion no longer reports that **screen.css** is modified – the changes have been written to the repository and the file is now up to date.

It's good practice to call update after a commit. This will pull in any changes made by other collaborators.

```
$ svn update
```

Adding and deleting files

Let's add a new page to our site: create **thanks.html** by copying **index.html** and altering the copy.

Once the file has been created in **dev_copy**, run **svn status**:

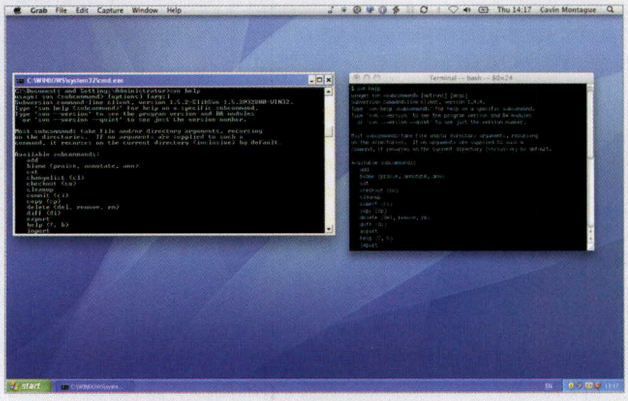
```
$ svn status
?  thanks.html
```

The question mark indicates that Subversion doesn't currently track this file. There are several cases where you wouldn't want all the files in the working copy to be added to the repository (log files, temporary file or cached data, for example) so Subversion won't track a file unless we explicitly ask:

```
$ svn add thanks.html
$ svn status
A  thanks.html
```

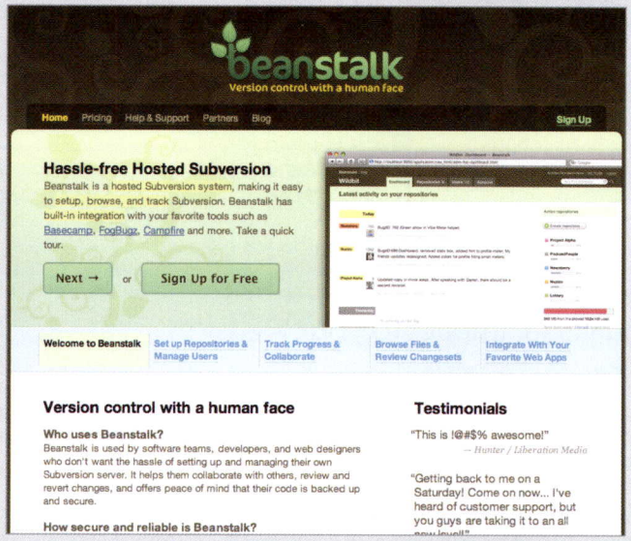
The 'A' flag shows that Subversion will now add **thanks.html** to the repository in the next commit.

Interfaces The prompt is your friend



The Windows DOS prompt (left) and OS X bash shell (right) might not be the prettiest interfaces in the world but there are a lot of powerful tools that can be used through them.

Hosted system Remote repositories



It's always a good idea to host your repositories on a server that's backed-up and properly maintained. But that can be such a hassle. The good folk at Beanstalk provide a range of hosted Subversion packages that remove all the faffing. There's a free package available that's great for taking your first steps with remote repositories.

```
$ svn commit -m 'Added the thanks page with draft copy'
```

You can edit multiple files between each commit. Add a page called **copyright.html** to **dev_copy** and then put a link to it in the footer of both **index.html** and **thanks.html**.

```
$ svn status
?  copyright.html
M  index.html
M  thanks.html
```

Next add **copyright.html** to the working copy's index and then commit all the changes.

```
S svn add copyright.html
$ svn commit -m 'Added copyright notice to all pages'
```

Try adding a few more pages to the repository. You can then delete any of them from the repository with the command:

```
$ svn delete example.html
D  example.html
```

At the next commit, the files marked as 'D' will be removed from the repository and your working copy.

Make some more edits to the files within the site. Try adding some images to the site. You'll find Subversion handles binary files as well as text: images, PDFs, Word files, in fact almost anything can be kept in a repository.

After each set of changes, commit to the repository.

Rolling back changes

Fast-forward a few weeks. Our fictional client calls to say that they've decided to stick with the old colour scheme and could we go back to the original background? Without source control, we'd be searching our hard drives for an old copy of the project and we might find one, or we might not. Not a problem with Subversion.

After bringing our project up to date with **svn update**, inspect the log for edits to our style sheet.

```
$ svn log stylesheets/screen.css
------------------------------------------------------------------------
r2 | gavin | 2008-09-17 21:25:26 +0100 (Wed, 17 Sep 2008) | 1 line
changed the page background colour
------------------------------------------------------------------------
r1 | gavin | 2008-09-17 17:53:14 +0100 (Wed, 17 Sep 2008) | 1 line
initial import
------------------------------------------------------------------------
```

Depending on other changes you've made to **screen.css**, the output of this command may vary, but you'll notice that only commits that have modified this file are listed.

Should you want to see the commit log for the whole project, run the command without giving a filename.

As you can see, the log lists the time of each commit and the name of the user responsible.

We can see the background colour was changed at revision 2. Use the diff command to inspect the change in more detail:

```
svn diff -r 1:2 stylesheets/screen.css
Index: stylesheets/screen.css
===================================================================
— stylesheets/screen.css      (revision 1)
+++ stylesheets/screen.css     (revision 2)
@@ -24,7 +24,7 @@
text-align: center;
font-size: 12px;
font-family: Helvetica, Arial, sans-serif;
-background: #C9E6EC;
+background: #FF0000;
color: #FFFFFF;
}
```

This command reads as 'Show what changed in screen.css between revisions 1 and 2'. As you can see, our original edit is returned. We could copy/paste this change back into our working copy, but we'll be smarter and have Subversion merge the change for us:

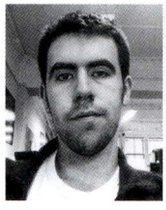
```
svn merge -r 2:1 stylesheets/screen.css
— Reverse-merging r2 into 'stylesheets\screen.css':
U    stylesheets\screen.css
```

Your style sheet will now contain the original background colour. You can use the merge command to pull any change, or group of changes, back into your working copy; you need never lose work again.

Where to go from here

We've only covered the basics of Subversion here. We haven't looked at, for example, how it can be used across a network, to keep a secure off-site backup of your code; how it can help teams work simultaneously on the same code without fear of overwriting each other's code; or how to use branching to help develop experimental features without interfering the ongoing maintenance of your production code.

If you'd like to learn more, one of the best resources is the book *Version Control with Subversion*, published by O'Reilly but also freely available to download at svnbook.red-bean.com. ●



About the author

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Areas of expertise Ruby, PHP, front-end development and Cocoa
Which (if any) football team do you support? None, I'm waiting for fox hunting to make a comeback

/CSS/working with PNG

Your essential CD
All the files you'll require for this tutorial can be found on the CD.

Craig Grannell delves into the underused but useful Portable Network Graphics format, showing you how it can bring flexibility and visual impact to your websites

Knowledge needed	Intermediate CSS and HTML
Requires	A text editor
Project time	20 minutes

Ask web designers about image file formats and most will rattle off the usual response: if you're working with line-art and/or flat colours, stick with GIF; for photographic content, use JPEG. However, a third format's been waiting in the wings for ages, and quite a few designers now reckon PNG's day in the sun is finally here.

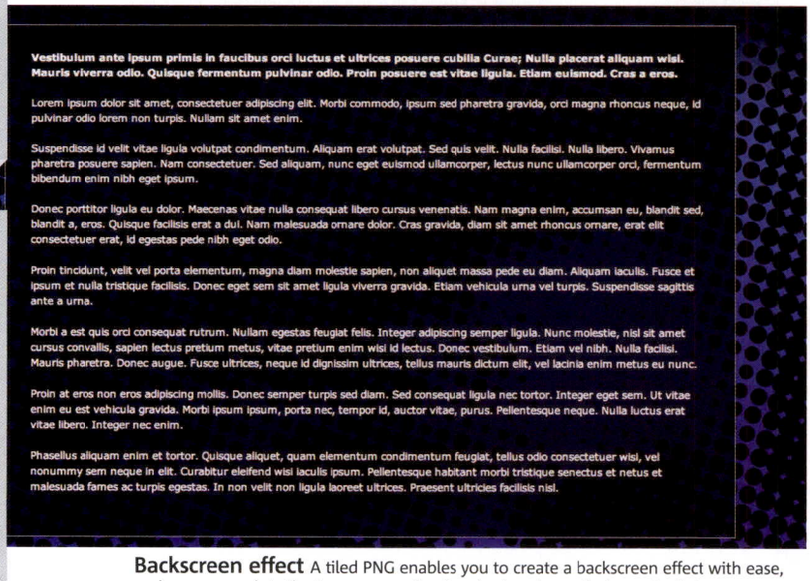
PNG comes in two flavours, 8-bit and 24-bit. In a broad sense, these mirror the capabilities of GIF and JPEG, although a typical 24-bit PNG is weightier than the equivalent JPEG. However, PNG does offer something for design purposes that the other two formats don't: alpha transparency.

The closest traditional web image formats come to transparency is in making specific colours within GIFs transparent. But unless your images are heavily pixellated or have very straight edges, such transparency usually results in a severe case of the jaggies. Also, it's an all or nothing proposition – you can't make your transparent colour 50 per cent transparent, for example.

With PNG, these problems vanish. Therefore, you can create elaborate gradients and transparencies in the likes of Illustrator and Photoshop, and export them to the web intact, adding visual clout to your designs.

Creating backscreen effects

The backscreen effect is a common design convention on TV, and is also occasionally used in print. It positions a semi-transparent layer on top of a busy background, onto which text or other imagery is placed. This means the background remains visible, but drops its contrast level, ensuring front-most content stands out.



Backscreen effect A tiled PNG enables you to create a backscreen effect with ease, and you can update the transparency level and colour by replacing a single image

You might think this effect's been common online for years, and Eric Meyer's Edge site shows one such example (meyerweb.com/eric/css/edge/complexspiral/demo.html). However, older designs typically require two versions of the background image, one of which has a semi-transparent overlay already burned in, and this image is then set as the background to the backscreen div.

With PNG, such faffing about is no more. Instead, you export a black or white semi-transparent square and apply that as a tiled background to a div. An example is on the disc, in the **backscreen** folder. Open **backscreen.html** in a web browser and you'll see the page has a fairly busy background image. Overlaid is a content area, which has a semi-transparent black background. The page body's background is still visible through this, but not so much that it distracts from the content. A single-pixel dark grey border helps the content area to stand out further.

Setting up this page is simple. The backscreen image is a square image filled with a black layer set to 70 per cent opacity and exported as a PNG. This is then applied to the content area (in this case, the **wrapper** div), as is the border, by using the following rule:

```
#wrapper {
background: url(backscreen-black.png);
width: 800px;
margin: 0 auto;
padding: 30px;
border: 1px solid #999;

}
```

Note the use of padding on the div. This provides the design with room to breathe. If content was too close to the div's edges, the busy nature of a background would overwhelm the design.

The advantage of using a PNG to set up this effect is that it's subsequently flexible. If the backscreen effect isn't strong enough, replace the **backscreen-black.png** image with a less transparent one.

If you're not keen on the colour, replace it with a white equivalent (for a kind of frosted glass effect) and switch the text's colour from white to

Expert tip PNG8 and Fireworks

If you're a Fireworks user and are working with relatively simple PNGs, there's an alternate solution to SuperSleight (see Dealing with IE6, top right) – output your image as PNG8, but in the **Optimize** pane select Alpha Transparency rather than Index Transparency. When the image is exported, the alpha channel will work as expected in modern browsers, and the transparency will revert to a GIF-like 1-bit alpha in IE6 and below. The IE6 solution isn't pretty, but it's suitable in many cases. Photoshop and other graphic editors don't output PNG8 in this fashion.

A paragon of transparency Effects akin to those on the LightCMS website (speaklight.com) can be created by layering divs with backscreen effects

black. (The file **backscreen-white.png** is included on the disc, so you can try doing this yourself). Also, by overlaying more than one backscreen effect, you can draw attention to different areas of the page; for example, the main content area could be as per the example, but the site's introduction could be highlighted as well using a semi-transparent PNG background.

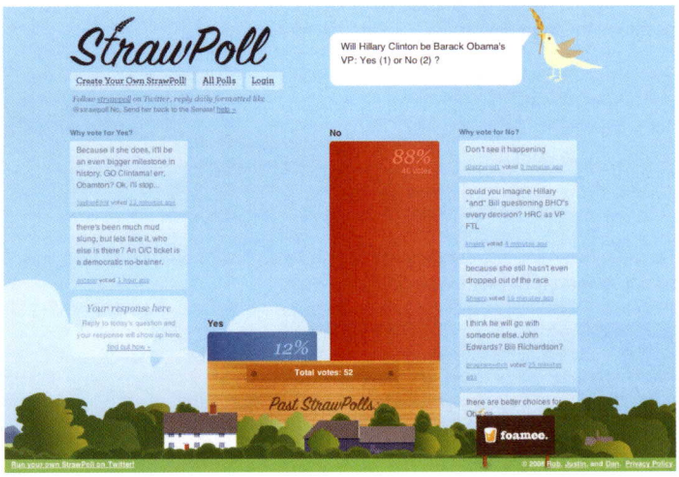
Combining PNGs

The second example document this month takes things further, and it can be found in the **evil sheep** folder on the disc. Open up **evil-sheep.html** in a browser and you'll see a web page with a blue background and a footer with a surprisingly evil-looking sheep.

Instead of appearing at the end of the web page's actual content, the footer is on screen permanently. The text within the page's main content area fades out behind it, and if you scroll the page a second background (with a starburst, sun and clouds) appears from behind the scene.

This shows how you can use a combination of PNG and CSS to create something visually arresting and standards-compliant, which can also be of practical use. Although our example image is irreverent, a serious business could use a footer to display its contact details, logo and some important links. And rather than the footer being intrusive and brutal from a design standpoint, it can instead be made to blend more with the website as a whole. (As described elsewhere in this tutorial, we recommend checking out strawpollnow.com for an excellent example of how such a thing can work).

The evil sheep page also shows a second example of the flexibility of working with PNG: positioning an overlay. The logo is placed over the top of the illustration – it's not a part of it – so it can be moved around independently, and the background can be swapped out, without having



Static footer One of the prettiest examples of a static footer is the one on StrawPoll (strawpollnow.com), which integrates wonderfully with the rest of the design

Expert tip Dealing with IE6

PNG popularity has mostly been held back by Internet Explorer's lack of support for the format's alpha transparency – it instead replaces the background with a slab of solid grey. With IE7, most of these shortcomings have gone – although its PNG support isn't perfect, it's suitable for everything shown in this tutorial.

However, old browsers die hard, and Internet Explorer 6 is still commonly used. With complex CSS, it often makes sense to use conditional comments to attach a specific style sheet for IE6 and below and simplify the design (in the evil sheep layout's case, IE6 doesn't understand the 'fixed' property and incorrectly positions the body's background). But for simpler PNG-orientated features, such as overlays and backgrounds, it's possible to use a proprietary Microsoft filter to 'force' transparency.

Various examples of implementation exist, including scripts to automate the process. For the cover files, we used Drew McLellan's SuperSleight (24ways.org/2007/supersleight-transparent-png-in-ie6).

Rather than a footer being intrusive, it can be made to blend more with the website

to add the logo to it. In this particular example, the benefit isn't massively obvious, but if you have a site that regularly changes its masthead background, you could have a PNG logo that permanently stays put and just change the background image. Also, this kind of overlay can be used for other tasks. For example, a band's website with a shop page could use overlays for items temporarily on sale, or an artist could use overlays to add watermarks to a dynamically created gallery, but without having to 'burn' the watermark into each individual image. Alternatively, the overlay could cover more of an underlying image, and provide a hole through which the viewer sees only part of what's behind.

Designing a background

Back to our evil sheep and how this particular design was created. In all, there are three images: the main illustration (sheep, hills, trees, rainbow), the wrapper background (starburst, clouds, sun) and the comic-book text logo. All of these started life as a single piece in Illustrator. The foreground elements were then dropped onto a single layer in Photoshop. Another layer was added underneath, which was filled with solid blue. The hex-value of this colour was noted (as it would provide the background colour for the web page as a whole), and then a layer mask was added, using a transparent-to-solid gradient to make the layer transparent at the top and solid at the bottom. This is what provides the fade effect when the page's content appears and scrolls behind the footer.

Prior to exporting, the image's width was set to 1,920 pixels and the gradient stretched across. The image was then saved as a PNG (**footer-background.png**). Elsewhere, the starburst, sun and clouds were exported, but as a GIF (**body-background.gif**). The reason for this was to keep the file size down; the equivalent PNG is also on the disc, and as you'll see it's about twice the size of the GIF. Finally, the logo was exported separately as **logo.png**.

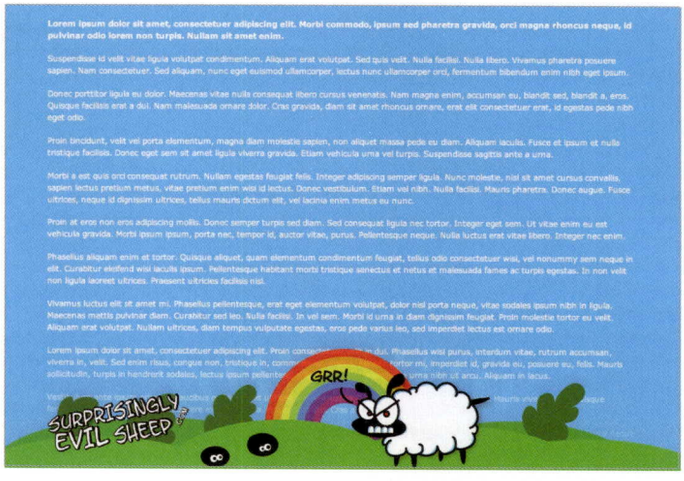
In order for a permanent footer to be created and positioned in front of other page content, it can't be nested within it. Therefore, the web page has the following structure:

```
<div id="wrapper">
 [content]
</div>
<div id="footer">
<div id="logo"></div>
</div>
```

>>

Above and right Here the page's content fades behind the footer. As the page scrolls down, the background of the sun and clouds is shown. Zoom in to see the subtle transparency effects PNG enables

Left The fortuitous website (fortuito.us) shows a rather subtler example of a permanent footer than the one in our example



The **wrapper** div houses the page's content, and the **footer** div is placed after it, with a **logo** div nested within. The **footer** and **logo** divs don't require content – the images are assigned as CSS backgrounds. You could place the logo inline using an image element, but for update purposes it makes sense to assign the image as a background. This also makes it simpler to deal with Internet Explorer 6 shortcomings regarding PNG. Note that if you need to turn the logo into a link, you can place a transparent GIF in the **logo** div and link that to the homepage. It's a bit of a hack, but as long as your code's semantic, it's forgivable.

Styling the web page

The CSS for the web page is also pretty straightforward. The document **evil-sheep.css** begins with the usual rule to reset padding and margins, using a universal selector. Next, the **body** rule assigns the **body-background.gif** as its background, putting it in a central, horizontal position, and vertically at the bottom of the page's body. This means that for longer pages, it's not initially visible, but it appears from behind the footer when the page reaches its end.

```
body {
background: #25a9e0 url(body-background.gif) 50% 100% no-repeat;
font-size: 62.5%;
}
```

Some values for the **wrapper** and **footer** divs are connected. For the **footer** div, the **height** value is defined equal to the height of the background image, and the relevant background image is set to a central, horizontal position. The **width** value of 100 per cent ensures the footer spans the width of the browser window, while the **position** value of **fixed**, along with **bottom: 0**, anchors the footer to the foot of the viewport. By using a **z-index** value of 1, the footer appears in front of other content.

In the **#wrapper** rule, it's the bottom padding value that's most important – this is roughly the same as the height of the footer. If it was too much smaller, you'd never see the content towards the end of the page, because it would be hidden behind an evil sheep and some rolling green hills.

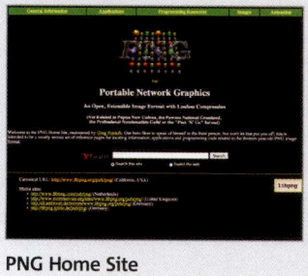
```
#wrapper {
color: #ffffff;
width: 900px;
margin: 0 auto;
padding: 20px 20px 210px;
}

#footer {
background: url(footer-background.png) 50% 0 no-repeat;
height: 220px;
color: #ffffff;
position: fixed;
bottom: 0;
left: 0;
z-index: 1;
width: 100%;
}
```

The **#logo** rule defines the **logo.png** image as the background of the **logo** div. Its **width** setting is as per the **wrapper**, meaning once the div is centred via the **auto** values within **margin** (for the horizontal margins), the logo lines up with the left-hand side of the content area. The **height** value is equal to that of the logo image itself, and the first margin value for the top margin (95px) positions the **logo** div vertically within the footer.

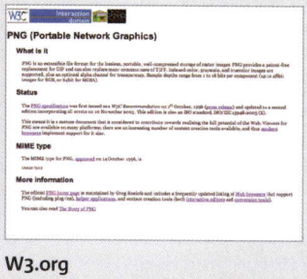
```
#logo {
background: url(logo.png) 0 0 no-repeat;
width: 900px;
margin: 95px auto 0;
height: 91px;
}
```

The final two rules just define font sizes and margins for the page's text, and so don't warrant further explanation. ●

Resources Learn more about PNG



PNG Home Site
If you fancy delving into the history and details of the PNG format, visit the PNG Home Site, which also helpfully confirms that it's not related to Papua New Guinea. So that's that settled.
libpng.org/pub/png



W3.org
To find out more information about PNG's relationship to web standards, and for handy browser-testing tools and links to the background behind the PNG format, nip over to W3's page.
w3.org/Graphics/PNG

About the author

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Areas of expertise Information architecture, site concepts, graphics, interface and front-end design
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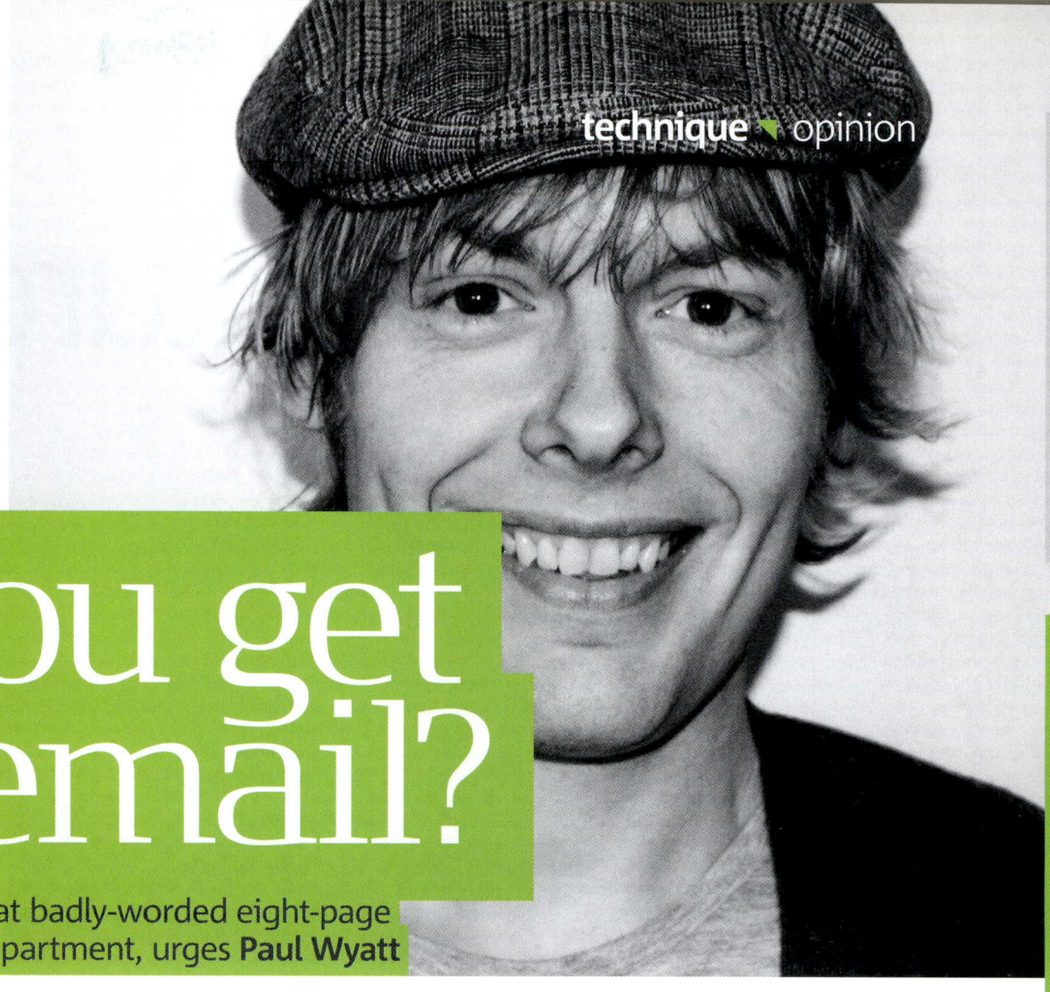

Paul Wyatt on...

Did you get my email?

Think before you forward on that badly-worded eight-page message to everyone in your department, urges **Paul Wyatt**

I've begun to detest technology. Oh, don't get me wrong. Gadgets and gizmos? I love 'em. That's what happens when you grow up on a diet of lightsabers, teleport bracelets and Seventies faux future tech. It's when technology becomes bossy that I start to detest it. We're constantly being cued in by little electronic beeps. Time to wake up. Time to attend a meeting. Answer the phone. Respond to that text.

Even my washing machine beeps. It screams at me when it finishes a wash cycle. Demanding immediate attention from me, it refuses to stop until the drum is emptied. The launderette may be a safer bet.

Bossy tech has been festering for a while. My first taste of it was with a harmless-looking Tamagotchi over a decade ago. This gimmicky what-shall-we-buy-Paul-in-a-hurry gift ran me ragged. Feed me. Clean me. Play with me. Define me. I swear I did everything it asked of me and still it died after a week.

Gadgets and tech demand our response. Our immediate response. And demanding tech takes on its most sinister form of respondez s'il vous plait – right now, damn it! – in the shape of the office email.

There are poor saps among us who spend all day hunched over inboxes. The little envelope icon appears in the corner of their screen and they're on to it. Like nurturing the unquenchable Tamagotchi, they react to the demands of the inbox. Playing email tennis, spinning a bit of politics and covering one's own derriere. All par for the course for a day in Outlook.

Oh and forwarding. Did I mention the art of forwarding? How many times have you received a project outline, feedback or work request with a cursory 'FYI' at the top of it? How much time do you then waste trailing through it trying to find the nuts and bolts of the request, how it affects you and what you have to do to resolve it?

You may, quite rightly, misinterpret a lot of the information. It's possible you'll be halfway through a project before the email sender walks past and gets their giblets in an twist. "What are you doing? That's not right! Did you get my email?"

Send and perceive

Well of course you got their email. But what you didn't get was the extra-sensory perception plug-in required to understand it. Just pressing a send button doesn't mean you're doing a good job. It's a bit like throwing a heap of Post-it notes at a wall and hoping some of them stick.

This is bossy tech as its worst. People use email to send garbled, badly considered information that, by the conventions of instant communication, requires immediate attention.

Or does it? Designers and developers aren't email whores. They don't spend their lives waiting for mails. They're usually up to their necks wading through code or looking for design inspiration. It's not realistic to believe that as soon as an email is sent, the knowledge it contains is automatically digested and fully understood by the addressee.

Using tech like this is silly. It's not always the original sender's fault; it's often the kneejerk response of the person who first receives it. "Oh I have an email. I must forward it on/respond immediately/bounce it on to someone else as soon as possible..."

It won't self-destruct within five minutes. There's nothing wrong with taking just a little bit longer to reply to it. Remember that the beep of the email arriving isn't a starting pistol.

Think about it. Plan it out. Those who do this well are a pleasure to work with. They consolidate client feedback and put together watertight project plans that leave little room for misinterpretation. With such wonderful order everyone can just get on with what they do best – designing or developing. That little bit of extra careful preparation can save money, false starts, time and, most importantly, patience.

> "Demanding tech takes on its most sinister form in the shape of the office email" Paul Wyatt

If only I could control my domestic bossy tech in a similar fashion. My washing machine is still screaming. The manufacturer replied, claiming they'd already got back to me with an answer on how to shut it up.

Strange, really. I'm quite sure that I didn't get their email. ●

When Paul Wyatt (www.paulwyatt.co.uk) isn't busy killing Tamagotchis he can be found designing for Sony BMG, Talkback Thames and Research Studios. He's currently writing his first book on interactive design with designer Luke Prowse.

/CSS/adventurous headings

Craig Grannell shows you how to get playful with online type and bring back some sparkle to an increasingly dull internet

Your essential CD
All the files you'll require for this tutorial can be found on the CD.

Breaking the mould While having clean body copy is important, experimenting with different fonts in your headers is a great way to assert some personality and uniqueness on your site

Knowledge needed Intermediate CSS
Requires A text editor
Project time 20 minutes

In magazines, type has many roles. Alongside the obvious informative purposes, it's often used to make a visual statement and grab people's attention as well as simply to look good.

Online, functionality has ruled the roost since the internet's conception and the current obsession with all things minimal means many websites are in danger of taking a trip to Blandsville where type is concerned.

Although designers should always take care to ensure they're not too 'clever' when it comes to body copy, there's no reason why they shouldn't be a little more experimental when it comes to main page headings.

So, despite my usual preference for relatively minimal aesthetics, I've used this month's tutorial to detail some experimentation with typography.

In each case, type is based around standard HTML text, styled using CSS and with a minimal amount of imagery.

In all cases, the examples shown are intended to act as jumping-off points – to provide an idea of a few things that are possible and hopefully inspire you to unleash your imagination and try something a little different of your own.

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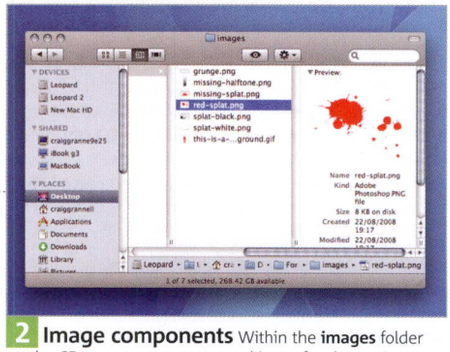
Last read *The R. Crumb Handbook* by Robert Crumb & Pete Poplaski

Expert tip Keep on playing

All good creative types never stop playing and experimenting. But web designers all too often become so preoccupied with efficiency and making a profit that they forget to play. All of the examples featured in this tutorial came from an afternoon of just mucking around with BBEdit and a couple of images from Photoshop. Try spending an hour yourself cranking out as many examples of a specific page component as possible – you might be surprised with the creative output that you end up with.

Default text

START Default text This is the starting point for all of the examples in this walkthrough. In terms of markup, this is a level-one heading within a div element. CSS sets the font family to emboldened Arial with a **line-height** and **font-size** of 120px.



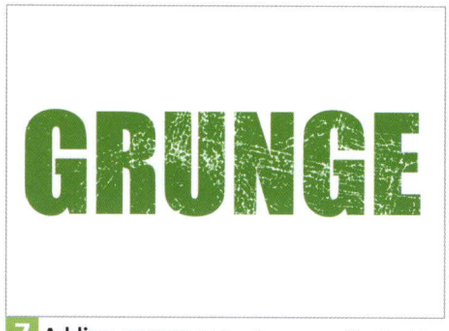
2 Image components Within the **images** folder on the CD are seven pre-prepared items for decorative use, although none of the images are of type themselves – text in these examples is always created using HTML. Most of the images are PNGs, enabling full transparency.

3 Add a border To start the first example, a 30-pixel red border is added to the bottom of the heading. A bottom border usually sits under the descender line, but by reducing the **line-height** value (in this case, to 81px), it's pulled up to the type's baseline.

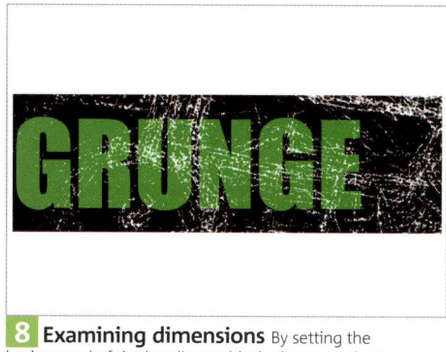
4 Refine and position Large type looks 'gappy' using default settings, so a negative **letter-spacing** value (-10px here) can be used to tighten tracking. A paint splat background is added here for visual interest and padding adds space above and left of the text.

5 A second background With the background being a PNG, the transparency means a second background can be added by defining one for the heading's container. In this case, the pop-art feel is accentuated. And due to the methods used, both type and images are easy to edit.

6 Grunge heading For the second example, a grunge movie poster-style heading will be created. Here, the type is defined as 160px Impact with 'normal' weight. The text has been transformed to upper case by using the **Text-Transform** property.



7 Adding grunge Adding the grunge effect is a bit of a hack – since it must sit over the text, a PNG image is placed within the level-one heading. In CSS, it's set to display as a block element and a negative **margin-top** value equal to the image's height pulls it in front of the text.



8 Examining dimensions By setting the background of the heading to black, the space the image demands is more easily seen. With the image displaying as a block element, the heading's content width now extends to that of the image, not the text.

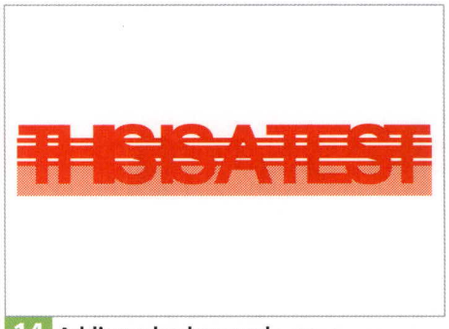
9 Fixed width In order to make the heading's de facto width closer to its content width, a set width in pixels is defined in CSS and the **overflow** property is set to **hidden**. Note, however, that antialiasing produces variable widths across browsers, so some leeway is needed.

10 Further cropping A common design convention in type is to crop the top and bottom of text. This effect can be achieved by using CSS. Here, the **height** value has been set to 100px and matched by an amended **line-height** value, resulting in the depicted crop.

11 Quick editing Because the type isn't image-based, its colour and content can be changed extremely quickly and the grunge effect can be used on multiple pages (assuming, of course, that the grunge image is large enough for all your required text strings). >>

12 Testing times We've already provided one example with reduced tracking, but this one will be more extreme and stylised. In the above image, the uppercase red text has typically tight tracking, which is defined by using a **letter-spacing** value of -6px.

13 Squished text Above, the **letter-spacing** value has been reduced further, to -20px. This results in characters overlapping slightly, making the letters merge together. This isn't suitable for all of a site's headings, but can be handy for a design-oriented intro.



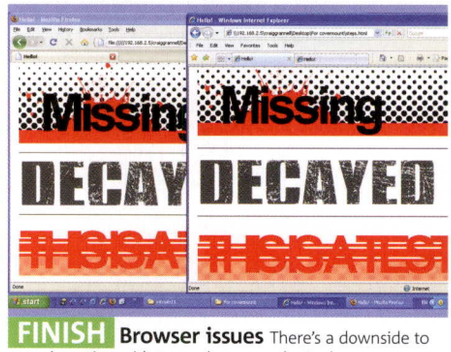
14 Adding a background In this step, a horizontally tiled background has been added, resulting in a visually arresting heading. However, readability is becoming an issue. If you do go down this road, do so sparingly to avoid compromising your site's usability.

15 Two-tiered headings This example offers a two-tier heading. The words are initially positioned by defining a narrow container width. However, each word will later be set to display as a block element. To facilitate this, each is wrapped in a **span** element with specific **class** value.

16 Refined positioning Here, the container's background has been set to black, its content to white and one pixel of padding has been added. The **span** elements are styled with a **width** of 450px, **padding** of 20px and set to display as block elements.

17 Adding imagery Here, each **span** element's individual **class** value enables a distinct colour and background to be defined for each: the top has black text on white, with a black splat; the bottom has the reverse. Note the one-pixel padding now effectively acting as a border.

18 A final splat This final example shows how imagery can prevent web page components from being boxy – the splat is applied as a background to the container and padding positions the heading (with a coloured background) so that the splat sits at the box's top-left.



FINISH Browser issues There's a downside to experimenting with type – browsers don't always agree. Often, **line-height** values need fine-tuning and character widths vary between browsers due to varied antialiasing algorithms. IE6 also needs fixes for any PNGs used.

Expert tip Pixel perfect

In the walkthrough, you may have been surprised that I was using pixel values for the text, since I typically work with ems. There are a couple of reasons for this. First and foremost, the text in these examples is generally large, meaning any 'fixed' text is unlikely to be problematic. Secondly, Internet Explorer, Firefox and Opera now all offer a full-page zoom in preference to a text-based zoom. With full-page zooms, there's no need for em-based workarounds for text zooming and pixels are the simplest method for defining on-screen sizes.

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/CSS/transparent PNG texture overlays

Your essential CD
All the code from this tutorial can be found on the CD.

Dan Rubin introduces a fantastic method for adding texture to text, using a pinch of CSS, an ounce of HTML, and a dash of design

Knowledge needed CSS, HTML and some elements of design

Requires A text editor and graphics editor

Project time 20 minutes

Reality isn't always smooth. Textures are everywhere and they help us bring realism to our otherwise virtual – and by technological limitation, flat – designs, enabling the web to feel more like real life. In our quest for texture, one of the challenges designers face is that neither browsers nor CSS provide a way to add texture to plain HTML text.

Creating weathered or worn looking text usually requires setting the text in an image editor, then using CSS image replacement techniques to hide the plain text and display the bitmap text as a background image. Unfortunately, this is very much a manual process, which doesn't help a great deal with dynamic text.

I hear a few of you saying, "Hey, you could always use Flash to add texture while keeping the text dynamic." However, that's not always as flexible and introduces more requirements. Use transparent PNGs and CSS absolute positioning and you have a solution that, with a little preparation and planning during the design process, gives the appearance of textured HTML text with all the benefits of web standards and non-reliance on plug-ins or scripting with few downsides.

Create a texture sandwich

I mentioned that some preparation is needed during the design process, so before we dig into the very minimal markup and CSS, let's review what we're trying to accomplish. Our ultimate goal is editable text that appears to be weathered, blending into the texture upon which it sits. The key to achieving this involves placing a separate texture layer above the HTML text using absolute positioning (and in certain cases the **z-index** CSS property), and making certain the overlaid texture lines up with the background texture so that the two blend seamlessly.

For this tutorial, let's imagine we're designing a blog template for mass distribution and the same design may be used on many different CMS-driven sites. In this scenario, applying the texture automatically to the blog title is much easier (and more bulletproof) than providing a layered file and requiring users to edit bitmapped text, export the image properly and upload to their server – assuming they have access to the server in the first place, or even the knowledge required to edit the template to point to a new image and possibly adjust width and height dimensions. Phew!

Thankfully, this technique requires no special knowledge or action on the part of the user, which ensures a consistent end result wherever the template is used. To keep things simple for now, let's just worry about the header, where the title of the blog will be located.

Covering content When selecting your texture or brush, make sure it's large enough to cover any content that will be layered below it. Here, the texture layer's dimensions will accommodate various lengths and sizes of text, even if it wraps to a second line

Dig in

If you haven't done so already, go to the **tut_png** folder on the CD and open the **example-text.psd** layered file in your image editor of choice. Poke around the layers a bit and you'll see how the background image and the worn texture we're applying over our text interact with each other. The perfectly aligned top texture layer makes it seem as though the background texture is bleeding through the text.

There are three separate elements that we need to combine to create this effect, each positioned on its own layer: a background image (in this example we're using a lovely photo from the stock photo site sxc.hu, but most images or textures will work equally well); an old-looking, worn texture (see the Resources box overleaf for links to some great collections of brushes and textures) and a copy of the original background image, which we'll combine with the worn texture to create a masked version of the underlying background image.

In Photoshop, this is accomplished by creating a clipping mask. Position the **background image** layer above the **worn texture** layer, then align your cursor over the dividing line between the two layers, hold down the **Option** key (or **Alt** in Windows) and click once.

The alignment of each element is important here: for this technique to work once we export our images, the worn texture (with its masked contents) must be aligned with the background image via CSS. The top-left corner of the transparent texture will be assigned to an element and positioned so it aligns perfectly with the identical pixels in the background image below, so keep that in mind while laying out your design.

Break out the code

Now that we have our design and texture sorted out, it's time to get our hands dirty in a text editor. In the files from the CD, open **example1.html** so you can follow along (note: as this technique relies on pixel alignment, I'm

Resources Minding your PNGs & layers

We won't cover the nuts and bolts of exporting images because the exported versions are provided on the CD. Just remember that the worn texture should be exported as a 24-bit PNG, with only the texture and masked background image layers visible (see Fixing PNGs for IE6 overleaf for one way to help that browser display the transparent bits).

Resources Even easier layered textures

If you're satisfied with worn text over a solid background, you can simplify the design and export just the worn texture (see **example4.html** in the files on the CD). Just fill the texture layer with the same colour as your background, export as a 24-bit PNG (with only the texture layer visible and the rest transparent) and that's it – the markup and CSS stay the same, except for the pixel alignment requirements, which are null and void thanks to the solid background colour.

using Eric Meyer's **reset.css** to help keep things consistent between browsers). First, let's give ourselves some markup for the header and title.

```
<div id="header">
<h1 id="title">Title of the Blog<span></span></h1>
</div>
```

You may have already noticed the one mildly ugly thing about this technique: the superfluous **span** sitting within the **h1** element. Because our texture needs to sit above the text contained within the **h1**, we need an element that comes after the **h1** in the document flow, or an element that we can position absolutely and layer above the **h1** using the **z-index** property (note that **z-index** only works on elements that are children of the same parent element).

In this simplified example, we have no other elements available, so adding an empty element after the text is an easy way to achieve our visual effect without making too much of a mess in the markup. When using this technique in a real design, you'll likely have other elements nearby that will do the trick, thus negating the need for the empty **span** (though it does come in handy when adding a link, as we'll see later on).

Round it all out

Because our background image extends below the height of our header area (which happens to be 170px tall, though it's invisible in our design), I've applied it to the outer **#wrapper** div, and also set a repeating background image on the **body** element just for kicks, along with setting some other defaults for completeness:

```
body {
background:#b5c3cd url(images/bg-body.png)
repeat-x;
font-family:"helvetica neue",helvetica,arial,sans-serif;
text-align:center;
}
#wrapper {
width:940px;
min-height:500px;
margin:0 auto;
background:url(images/bg-wrapper.jpg) no-repeat 0 0;
text-align:left;
}
#header {
position:relative;
height:170px;
}
```

That's all fairly straightforward, aside from the **position:relative** on the header, which we'll explain (and take advantage of) in the next step. Now that we've taken care of our background texture, let's style the heading:

```
h1#title {
position:absolute;
left:40px;
top:56px;
color:#e3eae9;
font-size:48px;
letter-spacing:-1px;
}
```

Then repeat the process, styling up its texture overlay. We're using **position:absolute** for both the **h1** and the **span** that will contain our texture. This takes advantage of the way absolutely positioned elements are handled by the browser.

Relatively speaking

By default, elements set to **position:absolute** are positioned relative to the browser window, unless they are a descendant of another element that has been assigned a non-default positioning (the default positioning for all elements is **position:static**). In that case, browsers calculate the position of the element relative to its nearest 'positioned' ancestor, which is what we're doing here (for more details, check out Douglas Bowman's excellent article *Making the Absolute, Relative* at www.stopdesign.com/articles/absolute).

We want the texture to sit above the heading text and to remain in place even when the text size is changed (within reason, of course), so we'll use this same method and set the **span** to **position:absolute** as well, which will cause browsers to use the **h1** as the positioning reference for the texture layer (**h1** is the nearest positioned ancestor of **span**). Finally, position it at the top-left corner of the **h1** and set its width and height to 100 per cent.

```
h1#title span {
position:absolute;
left:0;
top:0;
width:100%;
height:100%;
background:url(images/worn-texture.png) no-repeat;
cursor:pointer;
}
```

Proof is in the pud ... er, browser

If you haven't done so already, open up **example1.html** in a web browser and marvel at the stunning results. Switch to your text editor (you should still have **example1.html** open), edit the text within the **h1** element ("Title of the Blog") to say anything you like, then save the document and refresh in your browser. The text retains the texture without any extra action.

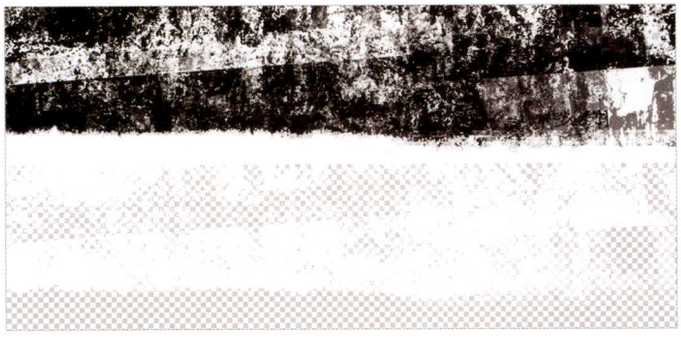
If your browser enables you to change the size of the text (rather than altering the scale of the entire page, as in Opera), resize the text and watch as the texture continues to cover the plain text without any further work necessary on your part.

But what if you want to add a link to the heading – to guide visitors back to your homepage, for example? Thankfully, that's as simple as adding the anchor (**a**) element within your **h1**, making sure it surrounds our empty **span** element: >>

This technique requires no special knowledge or action on the part of the user

Resources Images can have texture too

This method isn't restricted to textured text – we can also add texture to images without requiring any changes to the images themselves. The steps are the same as in the main tutorial, essentially substituting an **img** element for the text, and your texture can even overlay an image's borders if you desire (allowing textured hover effects, too). Take a look at **example5.html** and **example-photo.psd** to see how it all works.



White lines Preparing the texture for a solid background is a matter of filling the texture layer with the background colour before exporting it. Here, we've made the texture white, making it appear invisible unless text comes between it and the background colour.

```
>>  <div id="header">
    <h1 id="title"><a href="/" title="&laquo; return to the homepage">
Title of
the Blog<span></span></a></h1>
</div>
```

Then style the link:

```
h1#title a {
color:#e3eae9;
text-decoration:none;
}
h1#title a:hover { color:#fff; }
```

This is one situation where our apparently superfluous **span** element comes in handy. Because it's contained within the **a** element, the stacking of layers doesn't obscure the link's function (see **example2.html** to see it in action).

Kill two birds

So far, we've added texture to a single headline (albeit one that could wrap to multiple lines), but we can also use the same texture layer to cover, for example, a subheading or strapline.

In **example3.html** you'll see we've done just that, and really it's a matter of simply adding another heading (**h2**) to the markup we already had:

```
<div id="header">
<h1 id="title"><a href="" title="&laquo; return to the homepage">Title of the
Blog<span></span></a></h1>
<h2>A catchy strapline.</h2>
</div>
```

Then add the **z-index** property in the CSS (simplified here):

```
h1#title {
z-index:1;
}
```

The default **z-index** value for all positioned elements (the only elements this property applies to) is **auto**, so we can stack the **h1** and the texture it contains above the **h2** by setting it to any value above 0 (remember, our **span** is still contained within the **h1**). Keeping the two headings aligned when the text is resized requires a little repositioning of the two headings and a larger texture for the overlay – see the commented styles in **example3.html** for the specifics.

You may have already figured out that this technique will work with any transparent image, not just textures – any transparent shape can be used as a mask placed over the elements below. For example, you could create an image with a shape on a solid colour background, make the shape transparent and control the colour of the shape by layering it over a div, then setting the colour of the div via CSS.

It's worth noting that this method doesn't strictly require 24-bit PNGs, though you lose the 8-bit alpha transparency with any other format (meaning you'll get jagged edges). Depending on the texture, this might not be a problem, and you'll get smaller file sizes with 8-bit PNG or GIF as well.

This leads us to the issue of size: the example texture PNGs weigh in at scary sizes for live sites with even modest traffic, and I've had many discussions after recent presentations about texture regarding the added overhead. This is definitely something that should be considered when planning to use this method in your projects, though you can of course limit the file size of a 24-bit PNG by reducing its dimensions. ●

Some of the photos used in this tutorial are from stock.xchng (www.sxc.hu), a great free stock photography resource. Its sister site, stockxpert (www.stockxpert.com), effectively a pro version, is also worth checking out.

Our goal is editable text that appears to be weathered, blending into the background

Resources Finding the right texture

This tutorial would be difficult to put to good use without a selection of textures to choose from, and you can find the same terrific (and free) hi-res brushes used in our example files courtesy of Jason Gaylor (tinyurl.com/5egep7), or if you don't mind paying for your source material, visit MediaSlap (www.mediaslap.com). Are you looking for stock images to use as background textures as well? Look no further than stock.xchng (sxc.hu) or iStockPhoto (istockphoto.com). What's that? You'd rather create your own textures? Mister Retro's Machine Wash Filters make it easy to tastefully destroy any smooth and polished image you throw their way (www.misterretro.com/machine_wash_filters.html).

Resources Fixing PNGs for IE6

You're probably aware that Internet Explorer 6 is unable to display the transparent parts of 24-bit PNGs, which could be a problem if you want to use this tutorial but still have to support IE6. Luckily, Aaron Baxter (aka Aaron Belafonte) figured out a solution, using Microsoft's own AlphaImageLoader to solve that particular problem and wrote a useful little illustrated tutorial to enable you to get around it (tinyurl.com/594aps).

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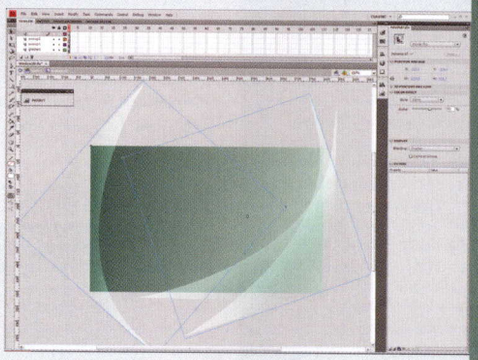
Ideal car The new Nissan GT-R

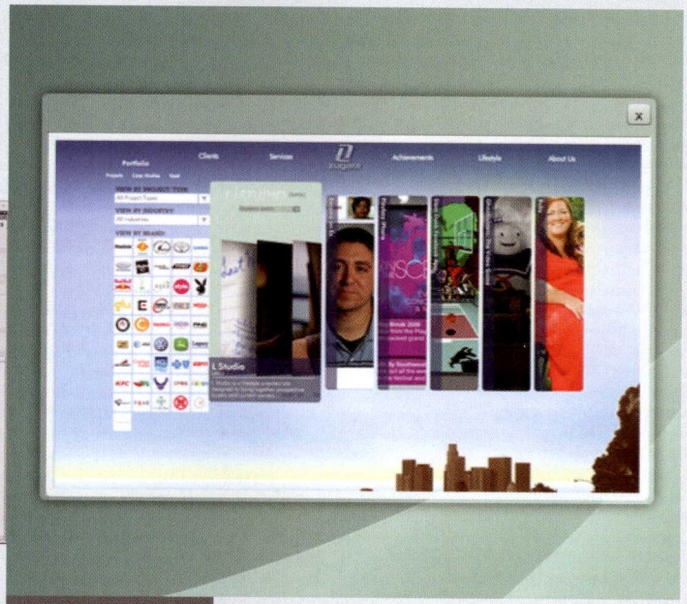
technique
flash

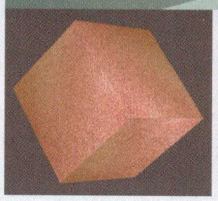
Add 3D, video and interactivity to your web pages

(above) **Cut your workflow in half** p64 – "We can now spend less time doing the drudge work and more time being creative"



(right & below) **Build a 3D window** p68 – "We're going to have you build a slick-looking, 3D window that will help add a little je ne sais quoi to your project"





(left) **Create 3D with Papervision** p76 – "Courtesy of Flash, Papervision brings real 3D objects and interactivity"

(above) **Build an XML-driven 3D carousel** p72 – "This navigational concept never seems to get old for clients"

On your essential CD
All the files you need for these tutorials are in the Flash folder

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/Flash/cut your workflow in half

Your essential CD
All the files you'll require for this tutorial can be found on the CD.

The latest version of Flash removes a ton of drudgery from web building, enabling you to spend more time doing all that creative, fun stuff, reveals **Paul Wyatt**

What you'll learn Paul Wyatt introduces some nifty Flash CS4 timeline time savers. Repetitive and mundane animation tasks are completed in a snap using CS4's new motion presets, tween spans and the new motion editor

Knowledge needed Understanding of Flash CS3

Requires Flash CS4 – download a fully working demo at www.adobe.com

Project time 30 minutes

Web workers rejoice – Adobe Flash CS4 is with us! Those savvy web designers and developers who have already purchased their copy will know that this version, more than any, has some serious time-saving features packed within it. Time you can save by not having to waste hours doing repetitive grunt work.

We've all been there with Flash. Updating motion tweens and effects contained on them can be a slow and painful task. Resetting keyframes and motion paths pretty much meant reworking most of your animation.

Thankfully, we can now spend less time doing the drudge work and more time being creative thanks to a much improved and flexible Flash timeline.

In the following tutorial you'll find out how to animate the Flash CS4 way. No more plotting masses of keyframes: all you need do is move the Flash playhead, move your movie clip and the keyframes are produced for you. You'll also discover how to use the new Motion editor and how to save any custom animation as a motion preset. Soon all those tedious repetitive tasks that soaked up your time will be a thing of the past. ●

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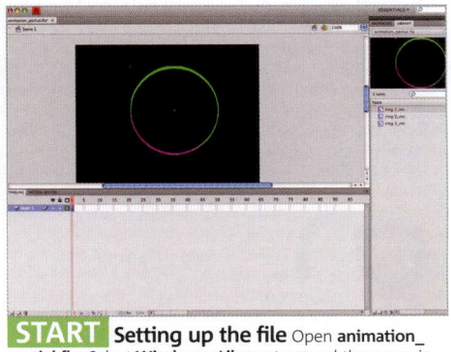
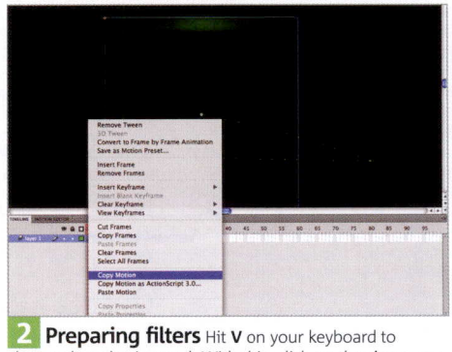
How do you like your eggs? Scrambled

Expert tip CS4 tween spans

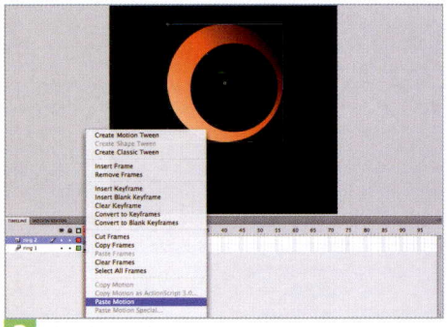
The flexibility offered by the new Flash CS4 tween spans will greatly speed up your workflow. Being able to slide, move and extend whole areas of animation to reposition it at different timeline points gives the animator greater control over their project. The ability to return to a tween span and customise it, add filters and change the amount of frames which it animates over saves the animator's sanity where previously it would mean selecting each keyframe in an animation and updating a filter or tween setting.



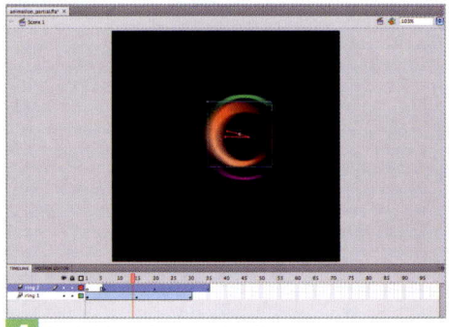
START Setting up the file Open **animation_partial.fla**. Select **Window > Library** to reveal three movie clip symbols contained within it (**ring 1_mc**, **ring 2_mc** and **ring 3_mc**). Rename the default layer **ring 1** and drag an instance of **ring 1_mc** onto the centre of the stage.



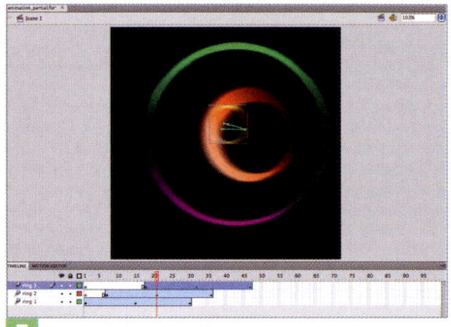
2 Preparing filters Hit **V** on your keyboard to choose the selection tool. With this, click on the **ring 1_mc** movie clip. Select the **Properties** tab and twirl down the **Filters** option. Click the first icon at the bottom of the panel to select **Add filter**.



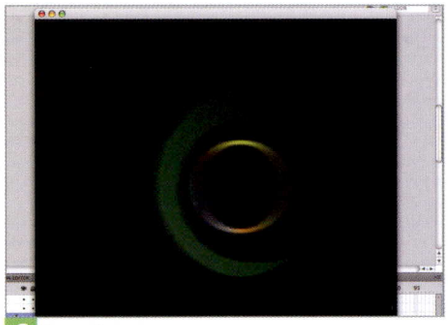
3 Blurring values In the **Blur** property settings, choose a **Blur X** value of **25px**. In the **Blur Y** value settings, click the link icon to unlink the X and Y blur value settings. Enter a **Blur Y** value of **5px**. Set the quality of the blur to **low**.



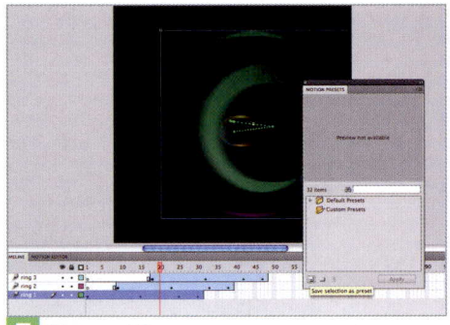
4 Shrinking the movie clip With **ring 1_mc** still selected, hit **Q** to select the **Free transform** tool. Hold down the **Shift** key and drag the bounding box inwards to 'shrink' the movie clip. Right-click on the first frame and select **Create motion tween** from the pop-up options.



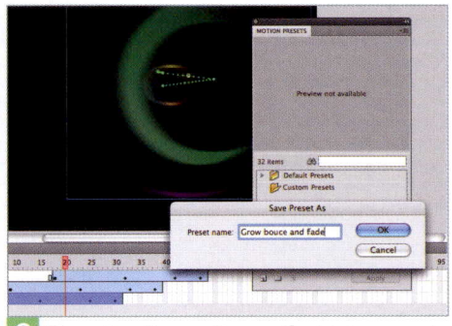
5 Extend the timeline A 24-frame tween span is created from your last action. Hover your cursor over frame 24 of the tween span until it turns into an icon with a left and right arrow. Now click and drag to the right to extend out the timeline. Drag the tween span out to frame 30.



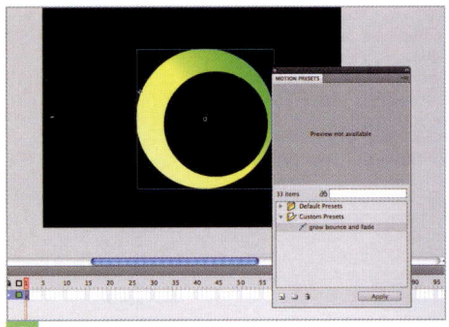
6 Rescale Drag the playhead to frame 15. Select the clip and use the **Free transform** tool to rescale it up by about 50%. As you do this, move the clip slightly off to the right. Move the playhead to frame 25. Rescale the **ring 1_mc** movie clip again so it occupies most of the stage area.



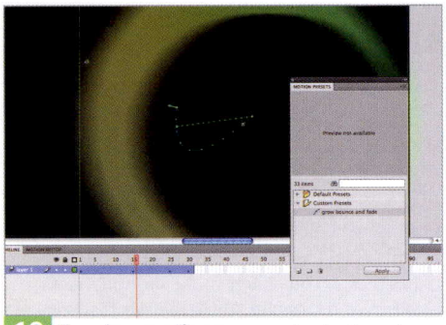
7 Alpha settings Move the playhead to frame 30. Rescale the movie clip until it expands beyond the size of the stage area. With **ring 1_mc** still selected, switch to the **Properties** tab and twirl down the **Color effect** options. In **Style**, select **Alpha** and turn the slider down to **0%**.



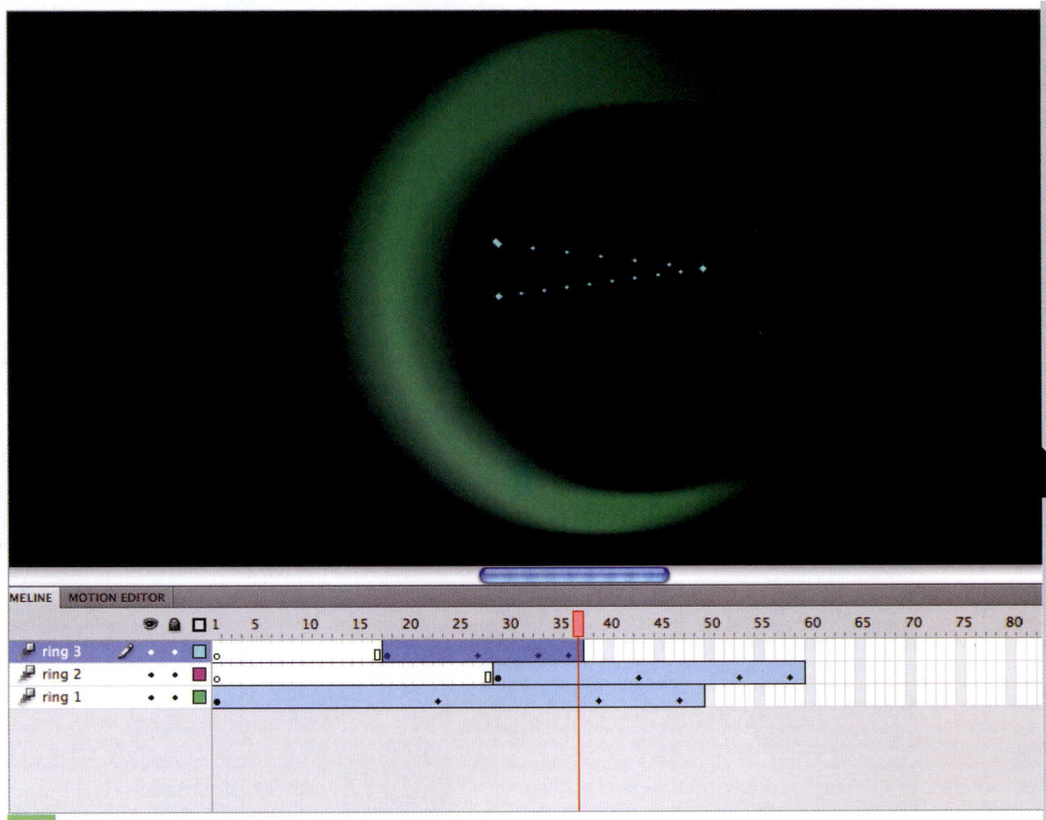
8 Changing the motion path Click frame 1 and a green dotted motion path line will appear. Click on the line and drag the motion path out to the right to form a two-sided triangle. This will guide the movie clip off to the right-hand side of the stage and then back to the left.



9 Ease it in Click in frame 1 to select the tween span. Next to the timeline tab, click and select the **Motion editor** tab. Twirl down the **Basic motion** property. In the **X/Ease** option, click the drop-down menu and select **Simple (Slow)**.

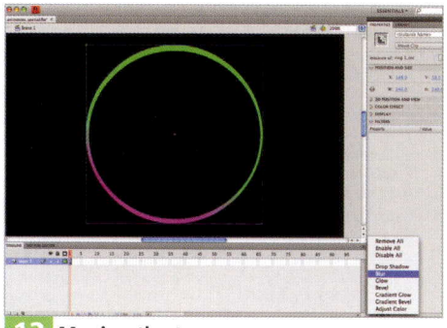


10 Copying motion Return to the timeline tab and click the first frame in the layer **ring 1** to select the tween span. Right-click the highlighted tween span and from the pop-up menu, select **Copy motion**.

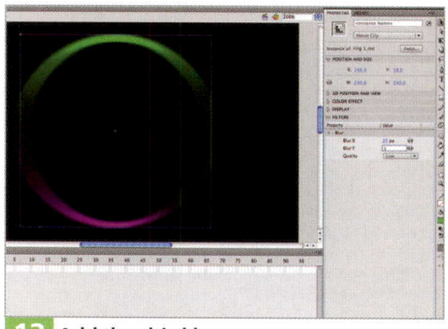


11 Adding more symbols Create a new layer and name it **ring 2**. Onto this, drag an instance of **ring 2_mc** and move this to the centre of the stage. Right-click on the first frame and select **Paste motion** from the pop-up menu options that appear.

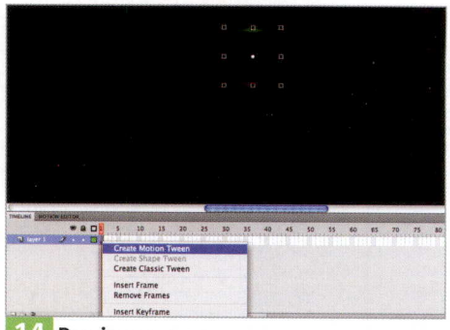
>>



12 Moving the tween span A new tween span has been created. Click anywhere on the tween span to select it. You can then drag the tween span left and right along the timeline. Drag it so the first keyframe of the tween span is positioned at frame 7 on the timeline.

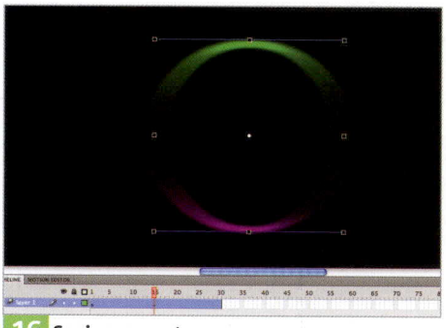


13 Add the third layer Create a new layer and name it **ring 3**. Drag an instance of **ring 3_mc** onto this layer. Right-click on the first keyframe and choose **Paste motion**. Select the tween span and move it across to frame 18.

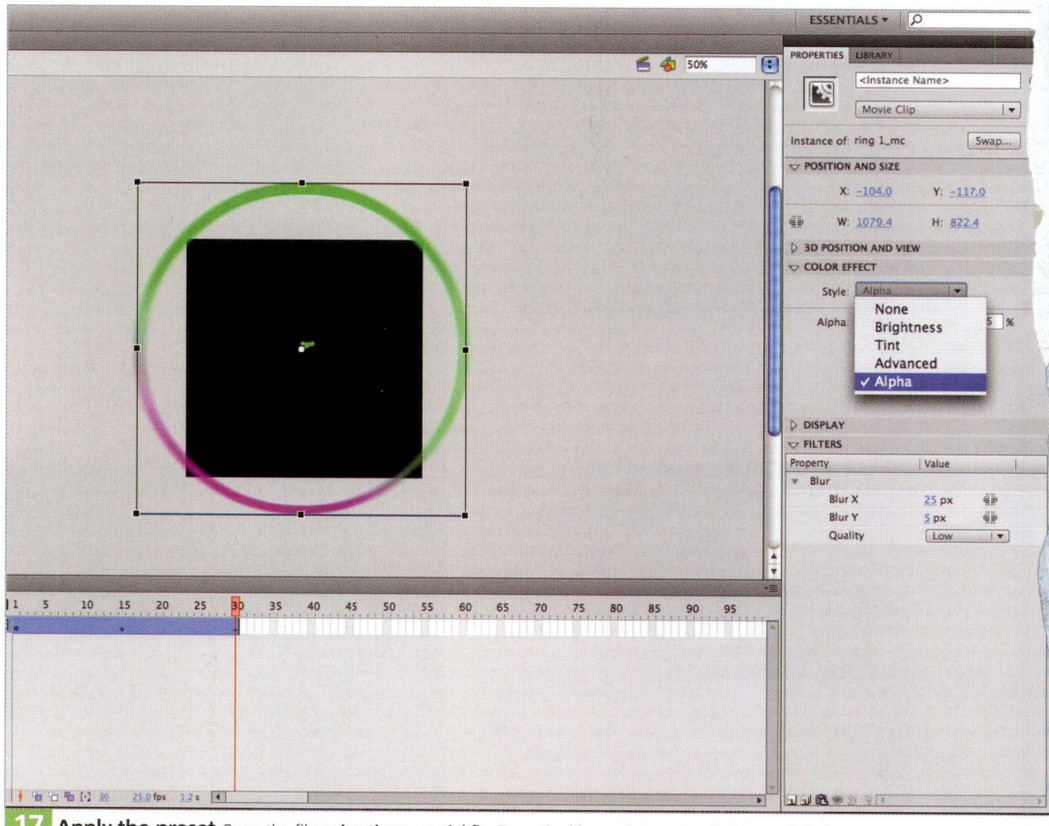


14 Preview Hit **Ctrl+Enter** to preview the animation. The same easing, scale, blur and motion properties have been applied to all three movie clips. Each one starts its animation at a different point thanks to offsetting the tween spans in the previous steps.

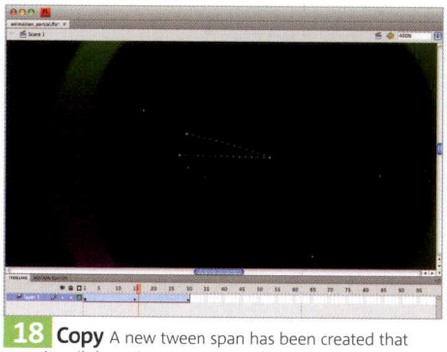
15 Presets To create a 'motion preset', which can be stored in Flash for other projects, select **Window > Motion presets**. Select the **ring 1** layers motion span. Click to highlight it (the tween span will turn blue). Click the **Save selection as** preset icon at the bottom of the presets panel.



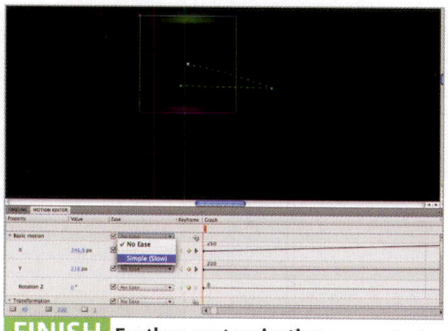
16 Saving presets In the pop-up **Save preset as** box, give it the name **Grow, bounce and fade**. This will then be stored in the **Custom presets** folder and will be available for use in any other Flash CS4 project. Let's try it out. Save your current project.



17 Apply the preset Open the file **animation2_partial.fla**. From the library, drag out an instance of **circle_mc** to the centre of the stage. With this movie clip selected, return to the motion presets panel and select the custom preset **Grow, bounce and fade**. Click **Apply**.



18 Copy A new tween span has been created that contains all the animation settings from the previous project. Hit **Ctrl+Enter** to preview it. You can still customise this animation by adapting its motion path guides or dragging the motion path to alter its animated direction.



FINISH Further customisation You can further experiment with the timings of the tween span animations presets by hovering your cursor over the end of their tween spans and dragging to the right to extend the time of the animation or dragging to the left to shorten it.

Expert tip New interface

The Flash CS4 interface may be somewhat of a shock. The timeline is now at the bottom of the interface, with the property inspector now displayed vertically on the right-hand side. To find menus you 'twirl' them down. This simply means clicking on a small arrow, which will then turn to face downwards and reveal further options. The tool bar has moved completely to the far right-hand side of the interface. The benefit is that you spend less time constantly resizing windows or having to hide panels simply to give you enough room to see your work on the stage!

Digital Camera Photographer of the Year 2009

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Are you a keen photographer? Then you can't afford to miss Digital Camera magazine's Photographer of the Year 2009 competition, with a top prize of £10,000!

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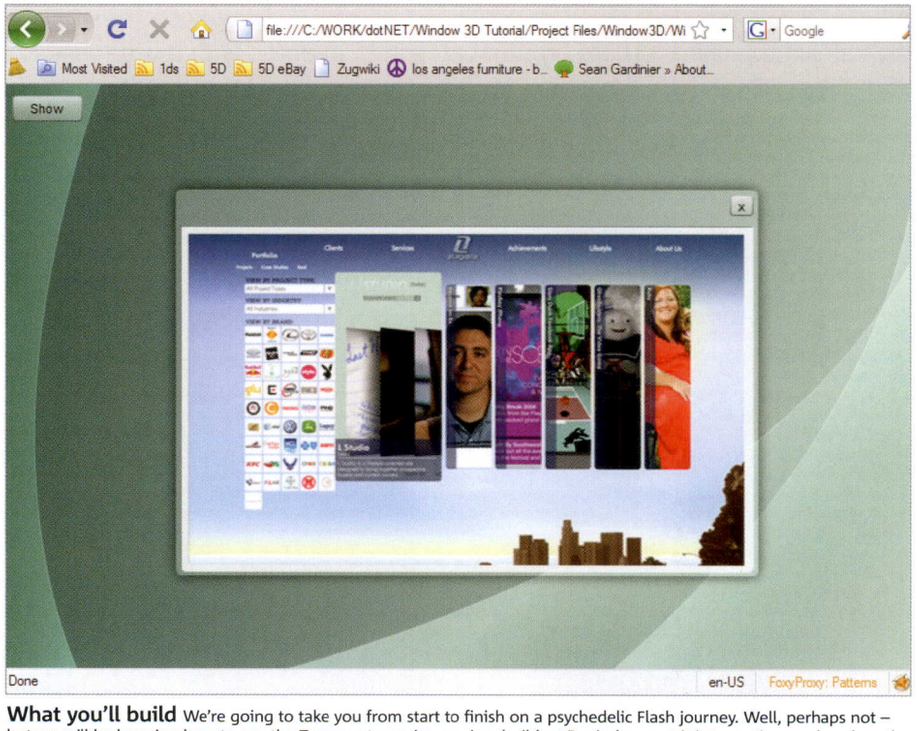
/Flash/ build a 3D window

Your essential CD
All the files you'll require for this tutorial can be found on the CD.

James DeBlasse of interactive agency Zugara (zugara.com) explores the new 3D feature of CS4 and demonstrates how to use the Tweener tweening engine to build a 3D window



What you'll build We're going to take you from start to finish on a psychedelic Flash journey. Well, perhaps not – but we will be learning how to use the Tweener tweening engine, build a 3D window, put it into motion, and explore the new 3D feature of CS4. Turn your normal display windows into a fun, interactive eye-catcher for you and your clients

Knowledge needed	Flash CS4, ActionScript 3.0
Requires	Flash CS4, Tweener
Project time	30 minutes

While Vista wasn't everyone's cup of tea, at least there were some cool new animations and a sleek Aero interface. If only it didn't take up 600+ megabytes of RAM ...

Well, today we're going to walk you through a Vista-like 3D window that will be sure to draw attention to your project without the messy RAM overload. Whether you're giving a presentation or delivering a high-end photography site, we'll show you the basics you need to spice up your display.

We're going to have you build a slick-looking, 3D window that will help add that little extra *je ne sais quoi* to your project. We'll also get to explore a few of the new features in Flash CS4, including the built-in 3D engine and the very helpful Project window. Plus we'll take you through the steps of implementing and utilising the Tweener tweening engine, along with some basic design and object-oriented programming concepts. We'll mix it all together for a delicious Flash stew.

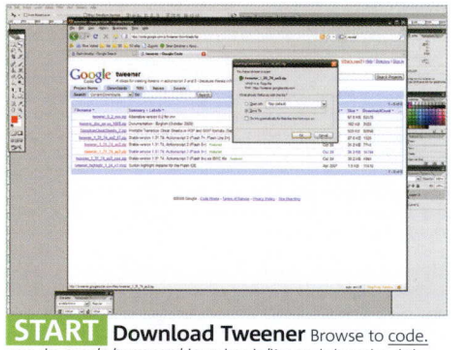
Don't worry if you don't have much coding knowledge: we'll also provide an in-depth analysis of the external class that we'll be writing in order to help you obtain a better understanding. ●

About the author

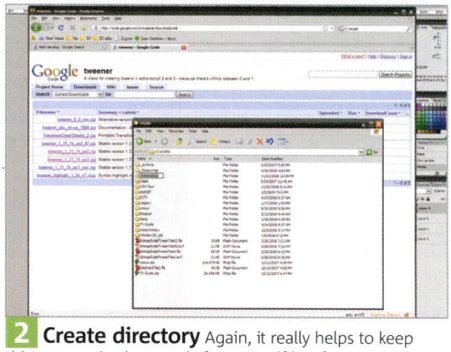
Name James DeBlasse
Site www.zugara.com
Areas of expertise Flash aficionado, integration wizard and food connoisseur
Clients Lexus, Toyota, Reebok
Who would play you in a movie? Kris Kristofferson

Expert tip Get organised

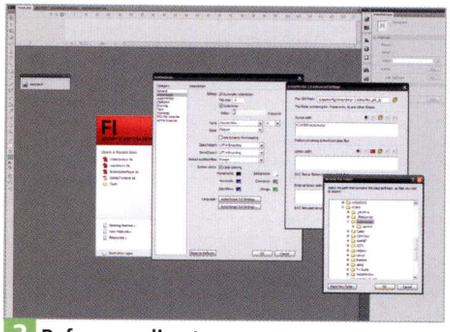
One of the biggest keys to a successful project will be the ability to organise. Now, most of us have our own ways of doing things. Some use version control systems like SVN, some simply version their own files. Find a method of keeping files structured and easy to locate, not only for yourself but also for your team. There's a decent level of 'standard' protocol, but it's best to find what works for you. You'll increase your productivity, decrease timelines, and most importantly, reduce your stress levels.



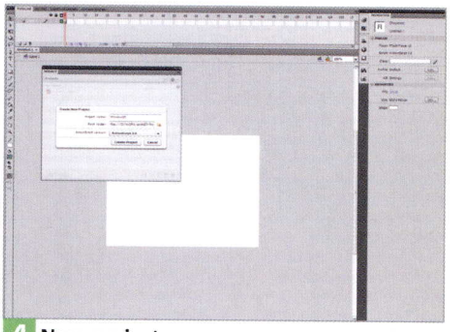
START **Download Tweener** Browse to code.google.com/p/tweener/downloads/list and download the latest stable AS3 version. Unzip to your global AS3 directory. If you don't already have this set up, create a folder with easy access that you can later reference in Flash.



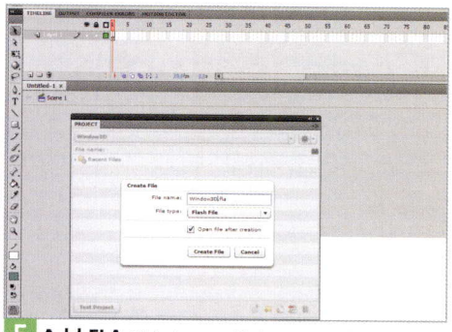
2 **Create directory** Again, it really helps to keep things organised, not only for yourself but for your team as well. By creating a global AS directory you can have one folder, either locally hosted or on an internal server, that anyone can reference for downloaded classes.



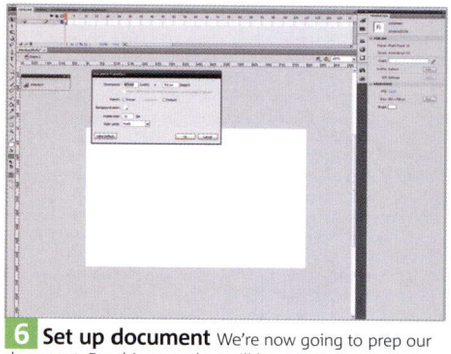
3 Reference directory Adding this directory to Flash will allow you to import classes without having to add them to new project folders each time. Once you set this folder as a target, Flash will always look to this directory for your AS classes, so there's no need to do it every time.



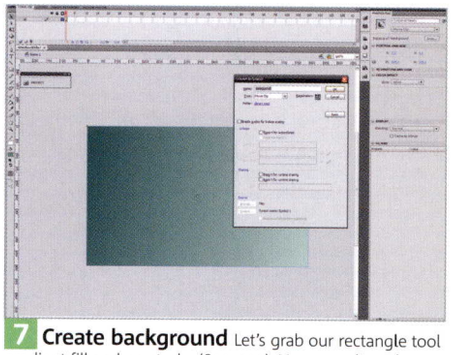
4 New project Create a new AS3 file. Open the project window (**Window > Other Panels > Project**). This is one of the new features of CS4. Click the **Project** drop-down and select **New Project**. Name it **Window3D**. Set the root folder to wherever you usually create Flash projects.



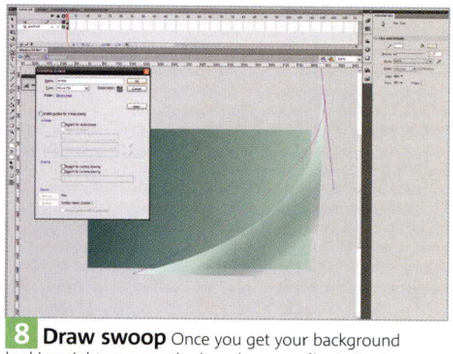
5 Add FLA Click the new file icon. From the drop-down, select **Flash File** and name the file **Window3D.fla**. Leave **Open After Creation** checked. This will populate the project folder and create the FLA. It will then open the FLA document, which will be ready for editing.



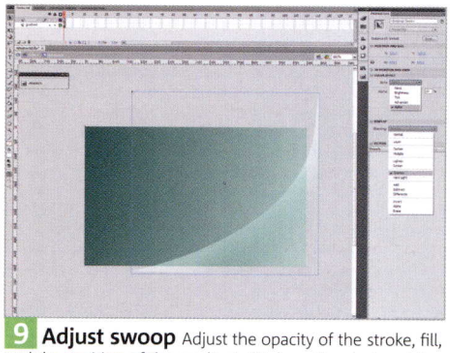
6 Set up document We're now going to prep our document. For this example, we'll be using 800px wide by 500px high. Also, we want to make sure to set the frame rate to 30fps. After that, you can select the first layer in the timeline and rename it **background**.



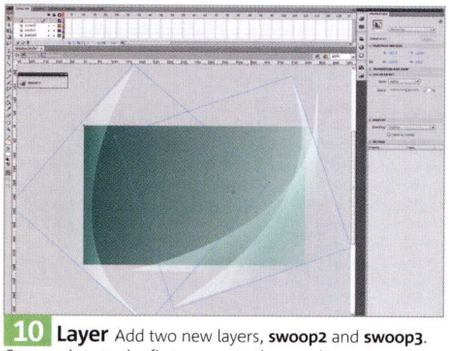
7 Create background Let's grab our rectangle tool gradient fill and no stroke (800x500). You can adjust the colour via the **Color** panel. Select the gradient and hit **F8** to create a movie clip. Name it **background**. Double-click the new clip created to edit the elements within.



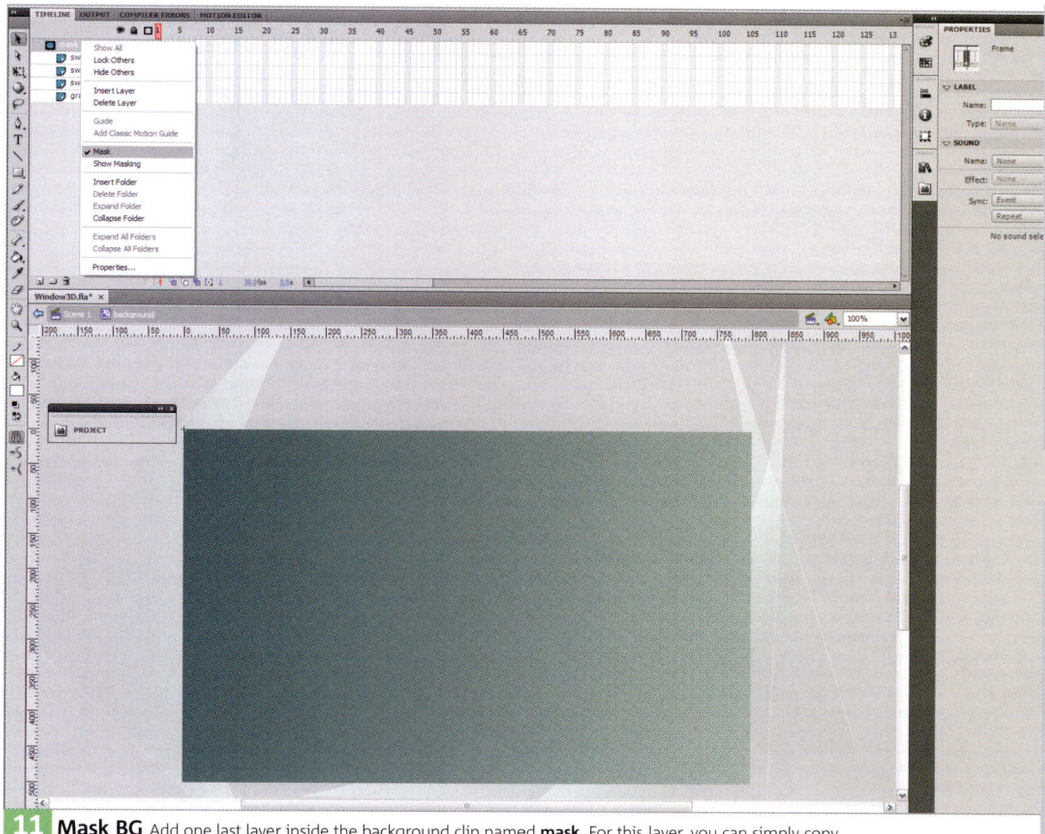
8 Draw swoop Once you get your background looking right, rename the base layer **gradient**. Create a new layer named **swoop1**. Grab your Pen tool with the same gradient fill as the background and a white stroke and draw a connecting swoop. Hit **F8** and name it **swoop**.



9 Adjust swoop Adjust the opacity of the stroke, fill, and the position of the gradient. We have the stroke white at 70% alpha and the gradient fades out. We've also set the alpha of the entire clip to 60% with a blending mode of **Overlay**, but you can adjust this to your liking.



10 Layer Add two new layers, **swoop2** and **swoop3**. Copy and paste the first swoop to the new layers. You can now rotate, move, adjust size and/or whatever you desire to achieve that nice Vista/OS X feel. Really play around with some of the blending modes to accomplish this.



11 Mask BG Add one last layer inside the background clip named **mask**. For this layer, you can simply copy and paste the **gradient** layer. Right-click on the **mask** layer and select **Mask**. Make sure you mask all layers. This will clean up the edges so the swoop overflow will not be visible.

>>

Code in depth

Let's have a closer look at our external class

Imports

Unlike previous versions of ActionScript, AS3 requires us to import all of our classes used in external classes. Here you can see we have imported four important classes: **MovieClip**, **Button**, **Tweener** and **MouseEvents**. It can be a bit tricky trying to remember where Flash references all of the classes we'll need. One way around this is to use a more powerful IDE such as Flex Builder or Flash Develop. These IDEs have stronger code hinting and both auto-import classes as they're being used.

Public methods

We have three public methods. These can all be accessed from outside the class. The constructor function, which was automatically set up for us, must remain a public method. We chose to keep the open and close methods public so they will be more expandable for future use. Open is accessed from the main FLA.

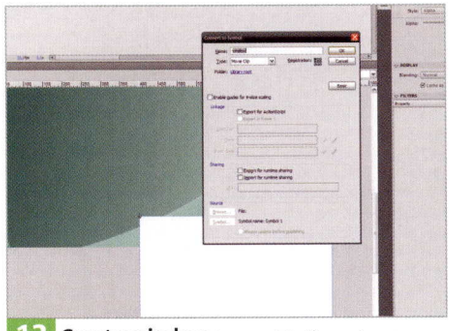
You'll notice that the close method has two arguments being passed through it. We're doing this for two separate reasons. First and foremost, any method being triggered from an event must have that event (in our case MouseEvent) passed along, even if you don't use it within the method. The second argument being passed is a variable called **speed**. We use **speed** to shortcut our hidden, default state of the window when we first run our application. Instead of rewriting everything that our close function handles anyhow, now we can simply call our close method with a **speed** of 0, so our window automatically defaults to the close state. Another great feature of AS3 is that we can set a default value for arguments if none are present. For example, when we call close any other time the close button is clicked, we don't need to pass along **speed** because it defaults to .8 seconds.

Tweener

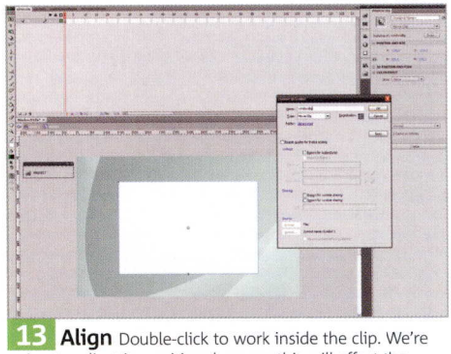
Because Tweener was developed with OOP in mind, you no longer have to remember a specific order to pass parameters like in the MC Tween days. It's much more flexible in the sense that we can order our parameters any way we choose now. Have a look through the Tweener documentation for a thorough overview.

ConfigUI

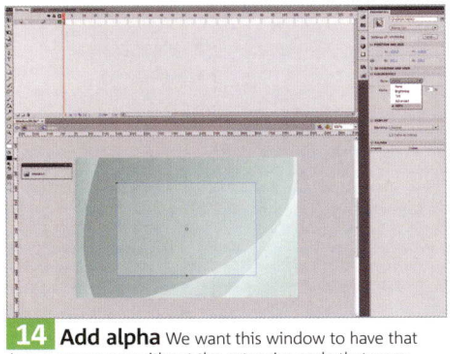
In configUI we've set up the startY reference already. Usually for a simple movie clip, we can just use buttonMode and we'll get our little hand cursor on roll over, but with the Button component we must set all three. We also add our event listener, which tells our button to listen for a mouse click. When the click occurs, we run our close function.



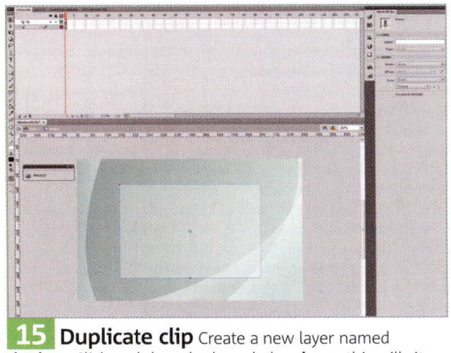
12 Create window Jump out to the main scene and add a new layer named **window**. Draw a rectangle (white fill, no stroke, 6px rounded corner, 500x300). Hit **F8** and name **window**. Position at **x: 400** and **y: 420**. Give the window clip an instance name of **window** on the stage.



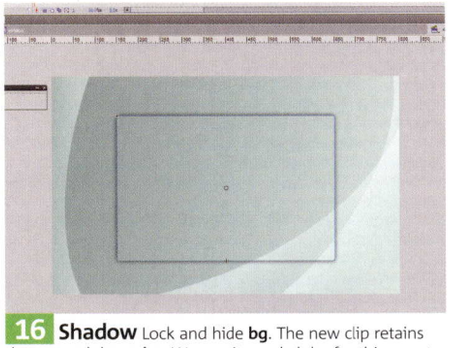
13 Align Double-click to work inside the clip. We're going to adjust its position, because this will affect the rotation point of the 3D window while opening and closing. **F8** the white rectangle and name it **windowBg**. Set **x: -250** and **y: -330**. Rename the layer **bg**.



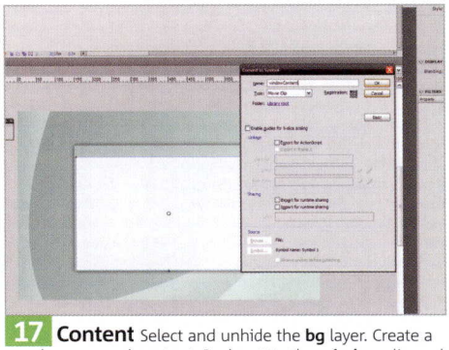
14 Add alpha We want this window to have that Aero appearance without the extensive code that goes into the 'Frosted Glass' look, so we're going to turn down the alpha and later add a shadow. This will produce a nice transparent look with very little effort. Set the alpha to 20%.



15 Duplicate clip Create a new layer named **shadow**. Click and drag the layer below **bg** as this will sit behind it. Copy and paste the **bg** layer to **shadow**. The shortkey is **Control + Shift + V**. This will paste the copied item to a new layer in the same position as the copied clip.

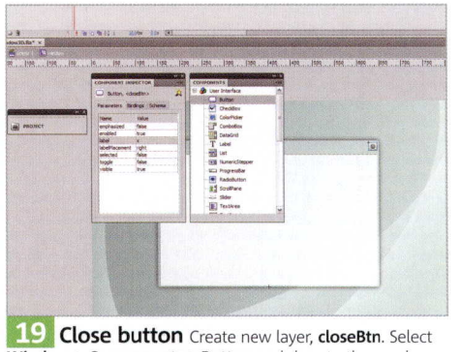


16 Shadow Lock and hide **bg**. The new clip retains the same alpha as **bg**. We won't need alpha for this so set the **Color Effect Style** to **None**. With the clip selected, click **Add Filter** icon. Select **Glow** (**BlurX/BlurY: 10px**, **Strength: 70%**,**Quality: high**, **Color: black**, **Knockout: checked**).

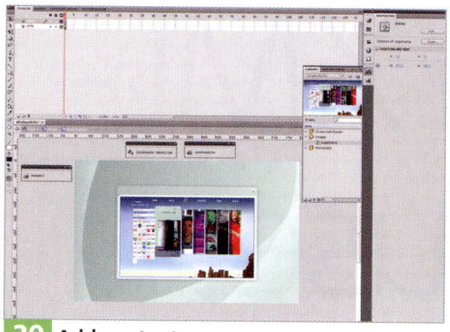


17 Content Select and unhide the **bg** layer. Create a new layer named **content**. Back out to the **window** clip and paste in the **content** layer. Set **x: -246**, **width: 492**, **height: 322**. Crop 26px from the top and set **y: -299**. Click **F8** and name **windowContent**.

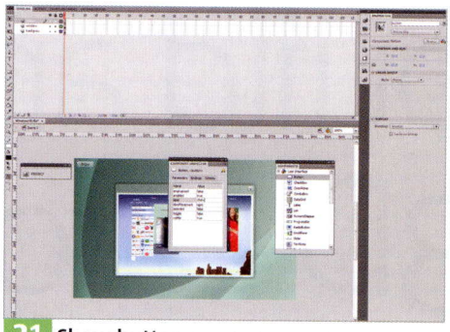
18 Add bevel Now we have the main form, we'll add depth with a subtle bevel filter. Select the content clip you just created and **Add Filter > Bevel**. Set **BlurX/BlurY: 0px**, **Strength: 85%**, **Quality: High**, **Shadow: black**, **Highlight: white**, **Angle: 45%**, **Distance: -1px**, **Type: inner**.



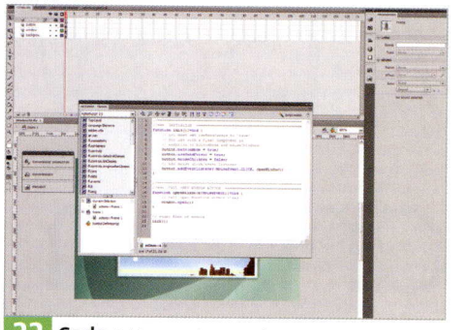
19 Close button Create new layer, **closeBtn**. Select **Window > Components > Button** and drag to the newly created layer. Adjust **x: 226**, **y: -326**, **width: 20**, **height: 18**. With the button selected, **Window > Component Inspector** and change Label to **x**. Give it an instance name of **closeBtn**.



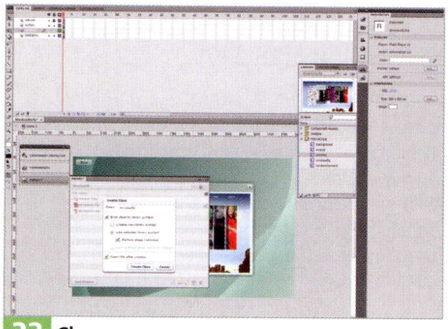
20 Add content You may add whatever you desire to the content of your new window. We've decided to keep it simple and just create a flat image of thumbnails of some of Zugara's latest work. Double-click **windowContent**, drop in an image and align.



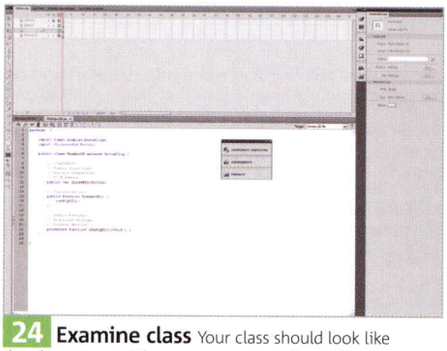
21 Show button Jump back out to the main scene and create a new layer, **button**. Grab the **Button** component from your library and drag to the new layer. Set **x** and **y: 10, width: 60, height: 22**. With the button selected, change Label to **Show**. Give this an instance name of **button**.



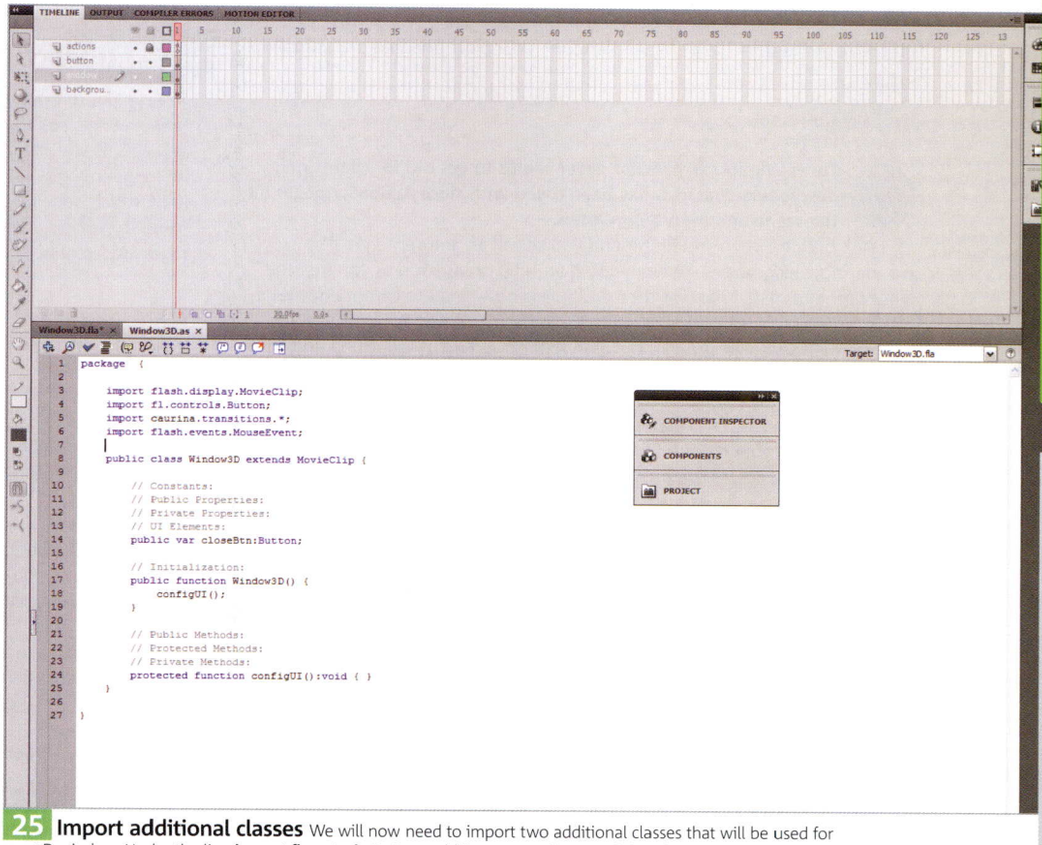
22 Code Add a new layer, **actions**. Open actions panel (**F9/Window > Actions**) and add the FLA code. After the mouse-click event is fired, call the **openWindow** function. This makes a call to an unknown **window.open()** function. We'll be adding this when we create the external class.



23 Class Our class will control the interaction and 3D animation of the window. Select **window** from Library. Bring up the **Project** window; click **Add class** icon. Name class **Window3D** and check **Bind class to library**. Select **Use selected library symbol**; check **Declare stage instances**.

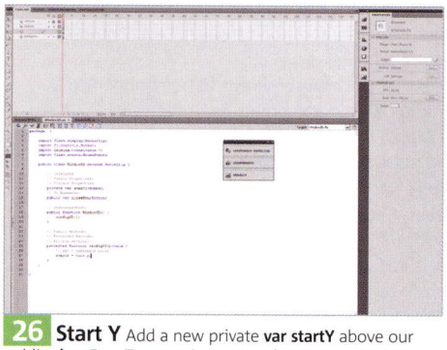


24 Examine class Your class should look like the above image. The reason we chose to declare stage instances is, as you can see, Flash pre-populated a **closeBtn** variable and a **configUI** function as well as the package structure and necessary imports. This will be our 'shell'.

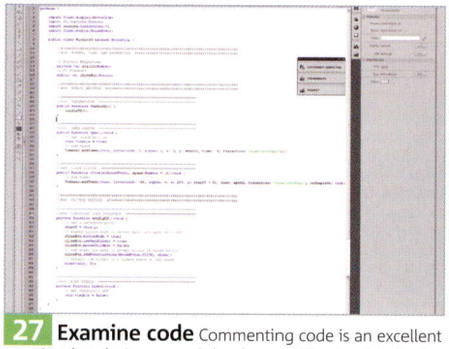



```
package {

    import flash.display.MovieClip;
    import fl.controls.Button;
    import caurina.transitions.*;
    import flash.events.MouseEvent;

    public class Window3D extends MovieClip {

        // Constants:
        // Public Properties:
        // Private Properties:
        // UI Elements:
        public var closeBtn:Button;

        // Initialization:
        public function Window3D() {
            configUI();
        }

        // Public Methods:
        // Protected Methods:
        // Private Methods:
        protected function configUI():void { }
    }

}
```

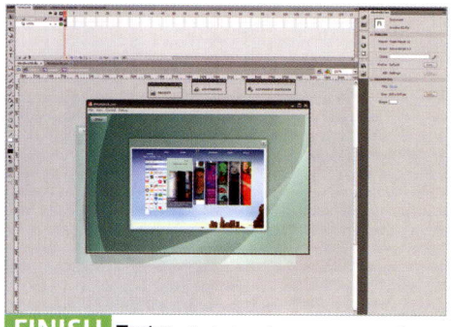
25 Import additional classes We will now need to import two additional classes that will be used for our 3D window. Under the line **import fl.controls.Button**, add **import caurina.transitions.*** and **import flash.events.MouseEvent**.



26 Start Y Add a new private **var startY** above our public **closeBtn**. Typecast it to a Number. Go inside the **configUI** function; set **startY = this.y**. Now, no matter where we place our window clip on the stage, we hold a reference to its original Y position for our tweening engine.



27 Examine code Commenting code is an excellent practice that designers and developers alike should adopt as a good habit. All of our methods, properties and elements organised in an easy-to-read manner – have a look at our in-depth code analysis to learn more.



FINISH Test Finally, test and export your movie. The window should be hidden when first opened. Click the **Show** button to make sure everything is functioning properly. You should see a nice, smooth 3D window that you can now easily reuse for future projects.

/Flash/build an XML-driven 3D carousel

Bring some carnival fun to your website's navigation system using the power of XML. **Faisal Ramadan**, senior Flash developer for ROKKAN, shows you how

Knowledge needed	Flash CS3, ActionScript 3.0, object oriented programming
Requires	Flash CS3
Project time	1 hour

This navigational concept never seems to get old for clients or developers. The idea has been toyed with since ActionScript 1.0 hit the scene and even before then.

Think back to when you first found yourself in an amusement park wondering which horse you were going to jump on as soon as you met the height requirement. That was then and this is now, and the carousel serves a much bigger purpose in Flash development than 40 seconds of carnival fun.

Here we'll show you how to build an XML-driven merry-go-round and how to get the most out of modularity by thinking small. Once you've built your first carousel, there's no reason to reinvent the wheel every time. This tutorial will serve as a template to maintaining your carousel and also as a building block to getting your carousel where you want it to be. We'll use a simple example that harnesses the power to create practically any 3D carousel.

Customisation through XML

Locate the **tut_flash** folder on the CD. Copy the folder over onto your hard disk. Open **CarouselExample.swf** using Flash Player 9.

You'll notice a selection of generic soda cans have been used for this example. Round and round they go, at a fixed speed, before you hover your cursor over them. Once you interact, they rotate in a 3D fashion, revealing more cans. The further away you get from the centre of the carousel, the faster they rotate.

Launch **CarouselExample.fla** in Flash CS3. You'll notice there's absolutely nothing on the stage: no library symbols to turn to and no actions in frame 1. However, you'll notice in the properties panel that a document class is set – **CarouselExample** – which is really pointing to **CarouselExample.as** located in the same folder as the FLA. So you've opened **CarouselExample.as** and what few lines you see may or may not seem complicated.

What you'll build We'll customise a 3D carousel using XML, then delve further into the code with hopes of using the supplied code classes as building blocks for bigger ideas

Expert tip ENTER_FRAME is the devil

To keep our carousel moving, we add an **ENTER_FRAME** event listener. However, this event type is also one of the biggest reasons for component slowdowns and site lags. Remember to **removeEventListener** when you no longer need it. Let's say you've added a **CLICK** event to every carousel item, which hopefully hides the carousel and displays a new section of some sort. Good practice should be to first **removeEventListener** and then to re-add it just before you alpha tween the carousel back to life.

Now let's customise this carousel and get it going! Open **carousel_data.xml**. You should see:

```
<carousel_xml number_of_items_to_display="5" start_speed="5" speed_
rate="1" x_radius="300" y_radius="50" x_offset="120" y_offset="210"
pov="180">
```

Before a single line of ActionScript is written for a component, there should be a general idea of what can be left outside of ActionScript and the FLA. We're building a carousel and want it to be dynamic. We want to have XML-driven variables and assets that can control the look and feel of our carousel.

Carousels differ in their assets. So we know we want the ability to swap out items as we please from the carousel. Carousels can also move at different speeds, so including an initial startup speed, **start_speed**, is a good idea. We may want an acceleration variable, **speed_rate**, for when the cursor hovers over the carousel.

Carousels come in different sizes. Here we'll need to be able to control the radius in terms of **x, x_radius** and **y, y_radius**.

You may wonder why we wouldn't want to hardcode these variables in ActionScript. We're thinking long term here. A few other variables that would be good to add in the XML file are offsets for **x, x_offset** and **y, y_offset** to readjust the overall positioning.

Lastly, I've added a pov variable so that when combined with radius and offset values, we can alter the overall view of the carousel. Let's change **x_radius** from 300 to 100. Save the xml file.

Reopen **CarouselExample.swf**. Our carousel seems to be confined to a smaller circular shape. Our radius is now 100 points from the centre, which means our overall diameter is 200. This is obviously a lot less when compared to the diameter being 600 points when our radius started at 300.

Now let's give our **x_radius** more room. Change it from 100 to 500 and **y_radius** from 50 to 15. While we're at it, let's change the **start_speed** to 55 and the **speed_rate** to 3. Save the xml file. Launch **CarouselExample.swf**.

Before you interact with the swf, you'll notice it moving at a much faster startup speed. Not blindingly fast, but noticeably different.

You'll also notice that when we changed our **y_radius** from 50 to 15, it thinned our carousel in terms of depth. Even though this is a 3D carousel, it isn't real 3D. There is no z-axis. Imagine if you have an x/y plane drawn on paper, where x is the horizontal line and y is our vertical line. This x/y plane is the centre of our carousel.

Radius reduced When we change the x_radius from 300 to 100, our carousel seems to be confined to a smaller circular shape

Sense of perspective Remember that this isn't real 3D. There's no z-axis, and when we change our **y_radius** from 50 to 15, it thins our carousel in terms of depth

Now you're tired of soda cans. So am I. Let's add a soda bottle from the images folder. Ensure that **bottle_1.png** is located the images folder. In **carousel_data.xml**, add the following line after the fifth item element:

```
<item url="images/bottle_1.png"></item>
```

Also, to give our carousel more depth, let's change **y_radius** to 75. Save the file. Run **CarouselExample.swf** again. If you don't see any bottles but still only see cans, this is because the **number_of_items_to_display** in the XML file is still set to 5. Change this number to 6 to include all items in your item list. Save and relaunch the swf. You should see the image at the top of page 74.

The curtain goes up

We've demonstrated how modifying a few variables through XML can give your carousel new life. Let's think in Objects. Let's 'think small'.

What makes up a carousel? Well, for starters, there have to be carousel items. The first class we'll visit is **CarouselItem.as.Locate** and open in Flash CS3 the file inside the folder **structure com > netmag > carousels**. The first thing you'll notice after you gloss over the import statements is that there are only three private properties a CarouselItem will hold (lines 24-26):

```
private var _position:Number;
private var _image_loader:Loader;
private var _asset:URLRequest;
```

Each CarouselItem is in charge of loading its own image asset and will be handled by **_image_loader**. The CarouselItem constructor takes a string as a parameter, which in theory will be the image path immediately converted to a URLRequest and stored in **_asset**.

The most important variable to note here is **_position**. We want each CarouselItem to be aware of where its place is in the carousel. This comes in handy down the line when you need to add filter effects to carousel items based on their position when in motion (lines 40-44).

```
public function loadImage():void {
_image_loader = new Loader();
addListeners();
_image_loader.load(_asset);
};
```

Public method

CarouselItem has one public method, **loadImage()**. The reason this is a public function and not code executed in the constructor is so we can control when the image load begins. To ensure that all carousel items complete their load without a hitch, we enforce a sequential load process, which is handled by whichever object will instantiate CarouselItem.

For a sequential load to be effective, each CarouselItem must notify when the load request completes. On line 72, there is a custom event, **ImageLoadedEvent**, being dispatched to notify the listener that the asset representing a single carousel item has successfully loaded. This is CarouselItem's main goal.

FlexibleCarousel Class

Open **FlexibleCarousel.as**. Notice the private property declarations from lines 18 to 28. This should look familiar. This is where we'll store the XML variables discussed earlier, since it only makes sense that our component class would need this to function. Take a look at the constructor (lines 34-38):

```
public function FlexibleCarousel(total_items:Number):void {
item_load_count = 0;
total_to_display = total_items;
all_items = new Array();
};
```

To instantiate FlexibleCarousel, we make the commitment that at a bare minimum the object will need to know how many items make up a carousel. **item_load_count** is set to 0, since we need a counter to keep track of our sequential load process and want to start at the first element. We instantiate **all_items** so that we can store our CarouselItems objects as we create them –

Once you've built your first carousel, there's no reason to reinvent the wheel every time

this way, we can manipulate them as an iterative collection of data. Now let's take a look at public function CreateItem (lines 40-47):

```
public function createItem(image_path:String):void {
var new_carousel_item:CarouselItem = newCarouselItem(image_path);
new_carousel_item.visible = false;
new_carousel_item.position = all_items.length * ((Math.PI *2) / total_to_
display);
this.addChild(new_carousel_item);
all_items.push(new_carousel_item);
};
```

We make another commitment that, for there to be a single carousel item, there must be a string that represents an image path. We instantiate CarouselItem and immediately set its visibility to **false** because we don't want the user to see it on stage.

Introduced previously is the private property **_position**, which will now represent the placement of its carousel item. Let's analyse the calculation: **all_items.length** is 0 the first time this function is called, but we can see on line 46 that we push our new carousel item into the **all_items** array. So the next time this function gets called, **all_items.length** will be 1, and then 2, and so on.

We then multiply **Math.PI** by 2. **Math.PI** is a constant value equal to approximately 3.14 and represents a ratio of the circumference of a circle to its diameter. When trying to calculate the position of every item in our carousel, we have to place them accordingly and we have to know

>>

Add some variety Man cannot live by generic soda cans alone, so we'll add some bottles by inserting a line in **carousel_data.xml**

>> what the total items are. Therefore, based on the number of items in your carousel, we'll calculate the first three iterations together:

```
0 * (pi * 2) / 5 = 0
1 * (pi * 2) / 5 = 1.2566370614359172
2 * (pi * 2) / 5 = 2.5132741228718345
```

We must multiply PI by 2, since core ActionScript 3.0 Math class methods return the measure of an angle in terms of radians, not degrees. What does all of this mean to us? In short, there are 2 PI radians in a circle, which supply the overall degree measurement of a circle but in radians. This is how **_position** plays a factor in carousel item placement. The fact that a circle is 360 degrees doesn't help us here.

Sequential load process

We've instantiated all our CarouselItems, calculated their position and shoved them into the **all_items** array. Now we're ready to load our images using public function **loadImages()** on line 49 of **FlexibleCarousel.as**. This function is an accessor to **private function loadImage()**, which requires an index to initiate the load. We pass **item_load_count**, which is set to 0 (lines 53-56):

```
private function loadImage(index:Number):void {
all_items[index].addEventListener(ImageLoadedEvent.COMPLETED,
loadNextAsset);
all_items[index].loadImage();
};
```

Here we add the listener for each instance of CarouselItem. Then we call the function **loadImage**, which is public within the CarouselItem class.

Resources Sites with cool carousels

Enviga Merry-Go-Round
This website for Enviga's Sparkling Green Tea uses a three-item carousel with an ultra-cool blur effect to showcase the different flavours. Clicking on one of the drink cans causes an information box to instantly pop up.
www.enviga.com/#Flavors

Carousel in hand
The official home of Chicago rapper Lupe Fiasco features a neat carousel sub nav. As three shady characters rotate around the palm of Lupe's giant hand, a mystic light effect rises up to signal the click-to-action capability.
www.lupefiasco.com

Expert tip Adding filters

Each carousel item needs to be able to fancy itself up. Add drop shadows, blur effects and anything else you can think of inside of **CarouselItem.as**. There should be two functions for each effect: an enable function and disable function. Remember, you have a position property that makes your effects act differently based on the constant movement of a single carousel item. I've commented out functions, **addBlur()** and **removeBlur()**. Feel free to uncomment the code block, and uncomment the **addBlur** call inside of the **setProperPosition()** function within **FlexibleCarousel.as**.

Inside the private function event handler, **loadNextAsset**, a few lines stand out in particular (lines 61-71):

```
item_load_count = item_load_count + 1;
if (item_load_count < all_items.length) {
loadImage(item_load_count);
}
else {
setProperPosition();
showCarouselItems();
this.addEventListener(Event.ENTER_FRAME,moveCarouselHandler);
stage.addEventListener(MouseEvent.MOUSE_MOVE, mouseMoveHandler);
}
```

After the first asset successfully loads, **item_load_count** is incremented by 1 to begin the image load for the next item, which should be **all_items[1]**. We check to see if **item_load_count** is less than the total number of items in the array. If so, we repeat the cycle of loading an image. However, once **item_load_count** is greater than the number of items in the stack, the **else** portion of the code executes.

Our final key actions occur. 1) We properly place all our carousel items based on the value stored in each object's **_position** property. 2) We show all our items by making visible **true** for all items in the **all_items** array. 3) We add an event listener to constantly update the positioning and scaling of each carousel item. 4) We add a listener to the stage for mouse movement.

The last two lines of code for discussion are (lines 84-85):

```
all_items[i].x = (Math.cos(all_items[i].position) * x_radius) + x_offset;
all_items[i].y = (Math.sin(all_items[i].position) * y_radius) + y_offset;
```

Trigonometry: run for the hills!

People generally see **Math.cos** and **Math.sin** and get worried, especially if they're less than three lines apart from each other. Here's where we need to actually use our calculated position. It's important to remember we're working in radians, not degrees. We take the cosine and sine of our placement in the carousel. All we're really doing is taking our current position and figuring out where it belongs in a circle based on a specified radius, and we do this to get the correct angle from the centre to the outer edge of the circle. Whenever the position property is updated for any CarouselItem, the angle is recalculated. To fully understand why cosine and sine are being used, further study should be done on how quadrants of a unit circle play a role.

The document class **CarouselExample.as** should be simple enough, as implementation for this carousel in other projects really only requires the understanding of **FlexibleCarousel.as** and **CarouselItem.as**. As a brief overview, all that occurs in **CarouselExample.as** is the loading of the XML file and the instantiation of **FlexibleCarousel**. Now use it, reuse it, and share!

About the author

Name Faisal Ramadan
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Areas of expertise Framework development, data manipulation, application structure design
Clients Adidas, Take2 Games, Nautica
Favourite takeout Food Burritos

Gary Ennis on...

Working for free

It isn't all about maximising cash, says **Gary Ennis** – helping out clients for nothing can produce long-term dividends

Deciding to work for free for one day last December proved to be one of the most controversial decisions we'd taken at NSDesign for a long time. In one fell swoop we managed to upset the Design Business Association (DBA), were the subject of a two-week forum thread in *Design Week* and gained several column inches in the process.

We were accused by the DBA of devaluing the work we do on a daily basis in the ecommerce, digital and design field. But was this genuine concern for our industry or a complete over-reaction? I know which side of the fence I'm standing on and, judging by the majority of online comments from other players in this game, it appears that I'm not alone.

I believe that, rather than take away from the work we do, we actually opened up our service to a much wider audience, who now have a much greater understanding of the true value of our work and what it can add to businesses.

We didn't intentionally set out to upset anyone or diminish the service that our industry provides. Nor did we mean for it to be seen as a sinister or cynical promotional stunt or ploy. It was simply a light-hearted idea, aimed at helping other SMEs and raising our own profile.

The plan (first suggested by our head developer Martin Sarsini) was to spread a little festive cheer by helping out small companies that were maybe struggling with the credit crunch or who were just looking for some advice on how to improve their own web offerings.

The debate that raged in the weeks after the announcement initially took us by surprise, but I stand by the decision and am happy to announce that in that one day we managed to help out over 30 individuals and organisations (a few of which were existing clients) and had a seriously good time doing so.

In this industry a lot of the work we get depends on pitching to potential new clients and showing them what we're capable of achieving. If you look at what we did on 19 December 2008, you could say it was simply another day of showcasing our work to prospective customers – no different to what we do on a regular basis, albeit highly focused into one intense day of this and nothing else.

> "In the current economic climate small companies need to be more flexible" Gary Ennis

The actual range of work that we carried out was pretty varied, with us doing everything from adding a little festive sparkle (custom graphics and backgrounds of a Christmas nature) to a handful of websites, to general 'spam advice', some consultancy on bulk emailing and how to ensure legal compliance with regard to your business email communications.

In addition, we conducted a number of site reviews, providing recommendations on improving design, usability and SEO, designed new logo concepts for a mobile-disco operator and online video production company, and set up a new blog for a cricket club!

We also helped out several more companies with their queries and not once did any of our team feel we were selling ourselves, the company or the industry short. What we did feel was that we were opening up many new potential business opportunities for ourselves. We may not benefit from any immediate paid work as a result of the efforts we went to, but those companies we helped out will certainly have us at the forefront of their minds when they do need the services we provide.

In the current economic climate small companies such as ours need to be more flexible and creative, standing out from the crowd more than ever before, and I for one will do everything within my power to ensure NSDesign continues to be the success it has been in the last few years. 2009 sees a decade in business for us and we're aiming to build on the strong foundations we've developed over the past ten years, which culminated in us winning the 'Outstanding Performing Business with less than 25 Full-time Employees' ROCCO Business Award.

There have been many challenges for us in 2009, but no matter how tough a year it is, when Christmas is approaching, I wouldn't hesitate to offer another 'work for free' day – and, unlike the Design Business Association, I don't expect our industry to crumble as a result! ●

Gary Ennis is the director of NSDesign Ltd (www.nsdesign.co.uk), a Glasgow-based consultancy that provides everything from domain name registration and hosting to custom web development and ecommerce systems. He's twice been shortlisted for Creative Entrepreneur of the Year.

/Flash/create 3D with Papervision

Your essential CD
All the code from the tutorial can be found on the CD.

Paul Wyatt demystifies Papervision and introduces you to its Flash component. You'll learn to create a 3D object then apply a texture and mouse movements

Knowledge needed Flash CS3, Dreamweaver CS3

Requires Flash CS3, Dreamweaver CS3

Project time 45 minutes

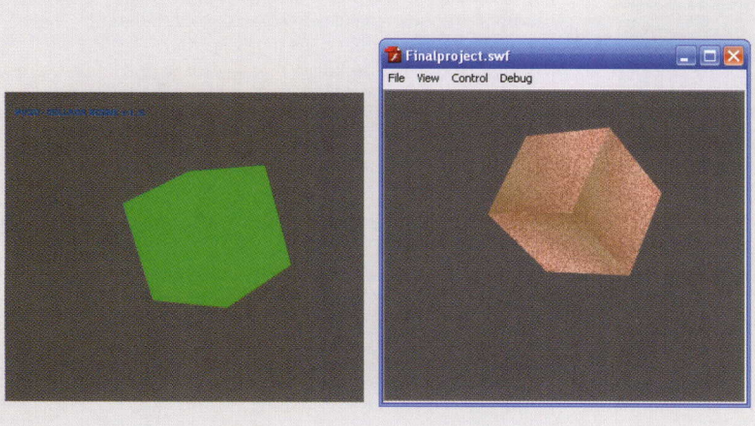
There's been an industry-weary vibe about 3D and Flash. This mostly came about because trying to integrate 3D in Flash was a lesson in how to trick the viewer. It was also a world of pain, involving creating 3D objects with a 3D program then exporting them as bulky PNG sequences – and then importing these into Flash. Interaction was limited to whatever sequences had been rendered out from the 3D software. These were converted to movie clips and ActionScript added to them. It wasn't the most fluid of workflows.

But Papervision changes all this. Courtesy of Flash, it brings real 3D objects and interactivity to your web pages. This isn't about faking 3D in Flash ... it's the real deal. Papervision began as a way to transform movie clips to give the illusion of 3D space. This was achieved by changing their size, position, rotation and by skewing them. It's come a long way since then, and now includes triangle tessellation, which is used to distort textures. These textures are then applied to the model in real time within Flash.

Papervision is developed and maintained by a core team of developers, who are continually updating and finding new ways to integrate 3D within Flash. One of these is via the Flash CS3 Papervision3D Component. In this tutorial we'll walk you through the process of using this component. First, we'll create a simple 3D model, and then apply a texture and some mouse movements to the 3D object.

We also have on hand one of Papervision's core team members, Ralph Hauwert. Ralph has been involved in many different types of Flash projects. These include the award-winning House of Tomorrow (www.hethuisvanmorgen.nl/english). He's currently involved in building the 3D web application Earthmine (www.earthmine.com), which enables advanced geospatial exploration and indexing.

Ralph is also one of the team members at Papervision3D, working on the upcoming version, its features and the engine architecture. As well as all this, he's recently conducted a number of training courses in Papervision in the UK. He answers our questions about how to get started with Papervision on page 77.



What you'll learn How you can use the Papervision Flash component to generate 3D objects. You'll find out how to work with COLLADA files to export a 3D shape, and then add texture and mouse interactivity using the Papervision3D Components panel

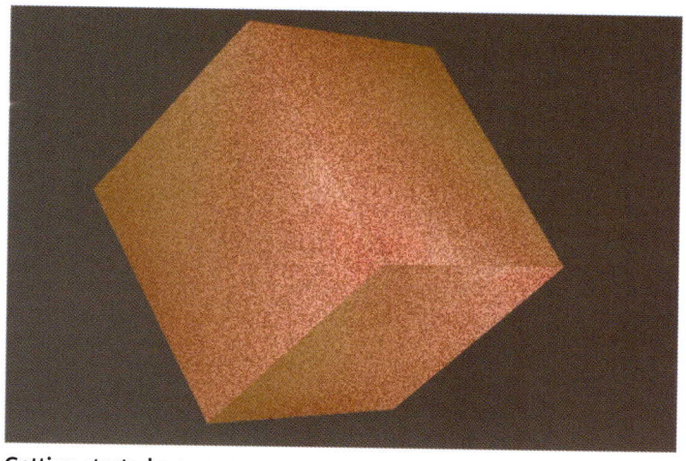
On the map 3D web application Earthmine will work with geospatial data to create an accurate inventory of urban environments, including detailed street-level maps

How does it work?

Papervision relies on an industry-standard XML schema, which is used to describe a wide range of 3D features. These files are known as COLLADA – which stands for COLLAborative Design Activity. These files are recognised by their file extensions, '.dae'. COLLADA was originally developed by Sony Computer Entertainment in order to create a standardised way of exchanging digital assets. For the purposes of Papervision, COLLADA files contain data from 3D models such as lights and model data. These files are exported from the 3D program and reinterpreted by the Papervision 3D engine.

Presently, Papervision doesn't support the full range of features available in the COLLADA schema. However, support for these is being developed and the COLLADA feature set is developing to include programmable shader effects and physics simulation.

So the workflow, when using Papervision, works as follows. A low polygon textured model is produced in a 3D program. This is then exported as a COLLADA file. Next, Flash is brought into the equation, by using the Papervision component (PV3d component) that's been installed. This component is used to hook up the COLLADA file to your Flash COLLADA scene. Once the 3D object is visible at design time, on the Flash stage, we then import a texture to the Flash library and wrap this around the model. The 3D object can then be set to include mouse interaction, via options available in



Getting started To begin this project, you'll find a basic 3D cube on the CD. You can also search for models on the web, remembering to pick one with a low poly count

the **Component Inspector** – or via purpose-built cut-and-paste scripts that are available in the **PV3d** panel.

Now, for those of you who are instantly turned off by reading about producing low poly count 3D models and texturing ... don't panic. The fun of using Papervision is within your grasp, without you needing a first-class qualification in 3D rendering to experience it.

If 3D modelling isn't for you, there are many resources on the web for finding royalty-free 3D models and textures. One example is TurboSquid (www.turbosquid.com). If your budget is tight, just type in the kind of model you're looking for and append it with the word 'free': you'll find that some generous-hearted members of the 3D community have posted a number of free models for you to use. Just remember that if you want to get hold of models this way, you have to choose one that has a low poly count. This means that if the number of polygons contained in the model is too high, Papervision will struggle to render the 3D image out. That highly detailed model of the Eiffel Tower is going to cause you problems. The COLLADA file from such a model would also be quite large in size. On the TurboSquid site, you'll be given a count of polys before downloading a model.

Papervision brings real 3D objects and interactivity to your web pages

The high-end 3D studios Max and Maya have plug-ins available from Feeling Software – the link is given in the next section – that enable you to export low poly models as COLLADA files. But for those of you who aren't willing to stretch to the cost of a major 3D software program, the free open source 3D content creation suite Blender also has export options – via a plug-in to produce COLLADA files. Blender is available for all major operating systems and has a pain-free learning curve. For more information and to download Blender, go to www.blender.org.

Learning the basics

When you're using the PV component, there are two ways you can add textures to your models. A COLLADA file can contain information on baked 3D textures that have been applied in the 3D program. These could be a combination of flattened textures and lights. A JPEG of the applied texture map would then be exported out as a JPEG and imported into the Flash library. The other – and simpler – way, in terms of learning the basics of the component, is to bring in a patterned JPEG texture and apply it directly to the texture-free model via the component. Here's how to do it:

A COLLADA file has already been produced using 3ds Max. This contains a very basic cube primitive shape. The object of this task, then, is to use this COLLADA file, add a texture and create an interactive material that can have mouse clicks added to it.

In depth We quiz Ralph Hauwert, a team member at Papervision3D, about this development in Flash

Ralph Hauwert

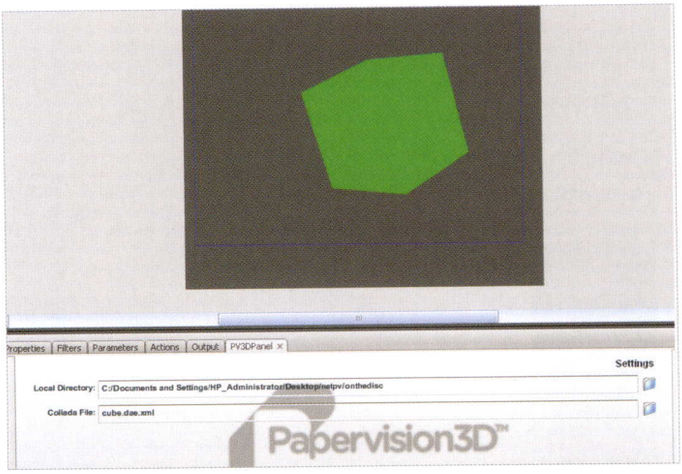
Occupation Freelance Flash, Flex and Air developer, and consultant operating under the name UnitZeroOne
About Ralph He's a core team member at Papervision3D
URL www.unitzeroone.com

.net: I'm a complete newbie to the world of Papervision. How can I extend my knowledge?
RH: There are several ways. First and foremost, we have a very big and strong community on our mailing list at OSFlash (osflash.org/papervision3d). Also, lately we're seeing a rise in sites oriented around tutorials for Papervision3D, such as pv3d.org and papervision2.com.
.net: Can I do great Papervision work without needed extensive ActionScript knowledge?
RH: Using the Papervision3D component, anyone with basic knowledge of the Flash IDE and 3D can create an implementation of Papervision3D. I think 'great' totally relies on the goal you're trying to reach. For the very advanced Papervision implementations, I can't see how to create these without knowing some ActionScript.
.net: Your training sessions in London recently were enormously popular: are you planning more?
RH: I'm currently talking with the Rich Media Institute to do training sessions across Europe. We're also planning to revisit earlier locations to do sessions aimed at advanced users. If demand is high we might even return to do the initial training. We're still looking into possible locations, so suggestions are welcome.
.net: Can you share your favourite Papervision project with us?
RH: There's a wide possible selection, but my current favourite is the Red Bull Flugtag Flight Lab, which shows great use of the engine in a beautiful environment. The plane modelling tools are executed very well and the game is fun!
.net: What's in store for Papervision in the future?
RH: With the coming of Flash 10, I think we'll see an even bigger rise of Flash and 3D and the 3D web. Current Flash 3D engines will be able to utilise the new toolset, available in Flash 10, to allow for more complex, better-looking environments and models. I'm looking forward to what the future has in store myself, but I think Flash will play a big role in a multi-dimensional web. Nonetheless, I still feel we haven't explored the boundaries of what's possible within Flash 9 and hope that Papervision3D will continue playing an instrumental role in this, enabling creatives and developers to visualise their ideas in the third dimension.

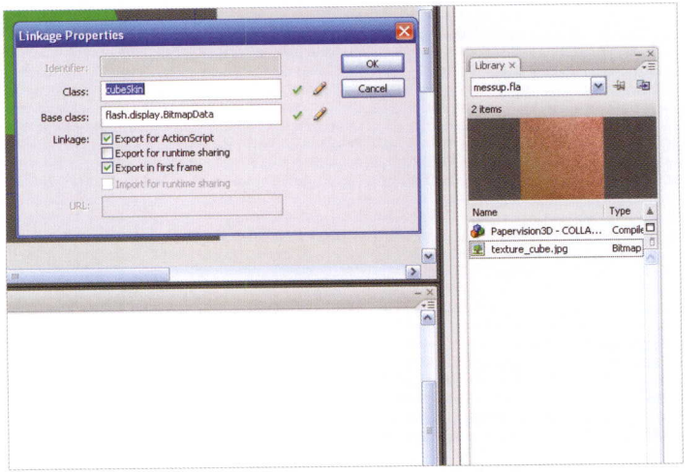
If you're not interested in the options for exporting a COLLADA file from a 3D program and would prefer to use the pre-built example, skip to the section under 'Install the component'. If you have a 3D software program and fancy producing your own COLLADA file, you'll need a 3D modelling program that supports COLLADA export.

There are a number of plug-ins you can download to give you this option from the 3D software's export menu. There are plug-ins available from Feeling Software for 3ds Max and Maya. For 3ds Max you'll need ColladaMax – download at www.feelingsoftware.com/content/view/65/79/lang,en. This is available for 3ds Max versions 7.1, 8 and 9. For Maya, you'll need ColladaMaya, which is available for versions 7 through to 8.5. You can download this from www.feelingsoftware.com/content/view/55/72/lang,en. Both of these plug-ins are free to download.

Illusoft, a games and multimedia company, has produced a plug-in to convert COLLADA to Blender and vice versa. For more information and downloads, go to colladablender.illusoft.com/cms.



Stage management Once you've installed the Papervision3D component, set it up on the Flash stage. Click and drag the PV3d panel to dock it to the Actions panel



Set the surface Assign a texture via the Flash library. Give your basic cube shape a new look by importing a JPEG texture file and applying the material to your model

>> Unfortunately, the widely popular Cinema 4D by Maxon has no support for COLLADA export. The only option available is the much-touted FBX convertor, available from Autodesk. You can export your model from Cinema 4D as an FBX format and use the FBX converter to convert it to a COLLADA file. However, having tried this a number of times, we've had less than great results with the quality of the converted file. If you wish to give it a go, download it from tinyurl.com/2zbvwl.

If you're using the export options in ColladaMax or ColladaMaya, be sure to select the options for **Bake Matrices** and **Triangulate** in the **Export Options**. Then, from 3ds Max choose **File > Export**, give your file a name and use the drop-down **File Type** box to save it as a COLLADA (**.dae**). Save your file.

For those of you who fancy looking under the bonnet of the COLLADA file, you can open it using any text editor. The large amount of data contained within the COLLADA file holds information about your model's structure, lights and material names.

Install the component

Now, we need to get the Papervision component. Before you install any Flash components, you'll need to have the Adobe Extension Manager installed on your computer. A recent update to the Extension Manager now includes support for CS3 component releases. You can check for the latest version at the Adobe website, www.adobe.com/exchange/em_download.

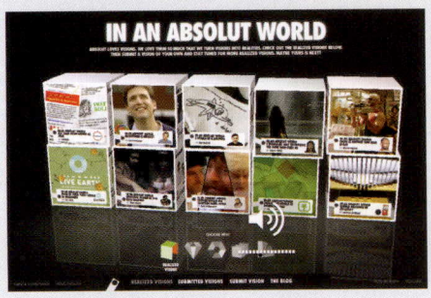
After installing the Extension Manager, go to the Papervision 3D downloads resource at code.google.com/p/papervision3d/downloads/list and install the latest version of the Papervision component – currently this is version 1.5.

This component makes it a snap to integrate a 3D model into your work. It's simple to use and will have you up and running with Papervision in no time. The component gives you the benefit of design time rendering and editing in Flash, and there are three types of materials supported: BitmapFileMaterial, BitmapAssetMaterial and MovieAssetMaterial. It gives you full access to the Scene, Camera and COLLADA objects. There are also panels in the component for modifying an object's rotation, the camera zoom and the camera focus – all at design time.

With the PV3d component now installed, open up Flash and create a document that's 350x300 pixels wide. Set the **Frame Rate** to 25 frames per second and save the file in your working directory. Select **Window > Other panels > PV3d panel**. The Papervision component that pops up can be docked at the bottom of the Flash interface alongside other panels, such as those for **Properties** and **Actions**. Reveal the **Actions** panel by hitting **F9** and then dock the **PV3d** panel by clicking on its **Name** tab and dragging it alongside the **Actions** panel until the tab changes to blue. Release the mouse and the **PV3d** panel is now docked.

Next, hit **Shift + F7** to reveal the **Components** panel. A Papervision3D component has been added to the list of available Flash components; click the **+** sign next to this. Two options will appear: **Papervision3d – Scene** and **Papervision3d – COLLADA scene**. As we now have a COLLADA file for this example, let's click and drag an instance of the **Papervision3d – COLLADA scene** component onto the stage. Use the **Free Transform** tool to scale this component to match the stage. Click on the component and give it the instance name of **examplePV** in the **Properties** panel.

Inspirational Papervision sites See 3D cube graphics in action



In An Absolut World
From our humble Papervision cube example to this amazing site, chock full of inspiration and more cubes. The 'In An Absolut World' site contains real-time 3D graphics, used to great effect for a stunning interactive navigation.
www.absolut.com/iaaw

WHITEvoid
Click, rotate and then reveal this jaw-dropping 3D navigation courtesy of WHITEvoid, which is based in Berlin. Be sure to check out WHITEvoid's other projects by clicking on this stunning bit of navigation work.
www.whitevoid.com/application

Massive Cube
Another 3D cube navigation system, this one was created by the award-winning interactive design and development company, Massive Cube. The image quality is superb and the intuitive camera controls are a joy to use.
www.massivecube.com

Let's use the **PV3d** panel to add other functions to our 3D cube. There are four sub-sections to the component: **Settings**, **Camera**, **Model** and **Tools**. The **Settings** panel is where you set up the local directory you're working in when producing your Flash Papervision work.

We use an absolute path to this directory as it's necessary if we're going to see the Papervision rendering at design time. Click the folder icon on the far right-hand side to navigate to this directory. Click the folder icon below this one to select your COLLADA file – **cube.dae**.

A green outline of the cube produced in your 3D program of choice now appears on the stage. This indicates that when the movie is previewed or exported it will have a material wrapped onto it.

We can now assign a material to the cube object by importing our texture file, **texture_cube.jpg**. Select **File> Import to library**. Select the JPEG file and hit **Open**. Right-click on this file in the Flash library. In the drop-down menu that appears, select **Linkage** to reveal the **Linkage Properties** pop-up box. Check the box for **Export for ActionScript** then give it a class name of **cubeskin**. Click **OK** to accept the changes.

Now hit **Shift + F7** to bring up the **Component Inspector**. Make sure you've got the COLLADA scene selected. In the **Component Inspector**, select the **Materials** list and click on its right-hand **Value** box. This will bring up the **Values** pop-up box.

Click the **+** button in this. In the **MaterialLinkageID** box enter the linkage name of **cubeskin**. In **Material Name** enter **CubeMaterial**. The material is now applied to the model. Hit **Ctrl + Enter** to preview this.

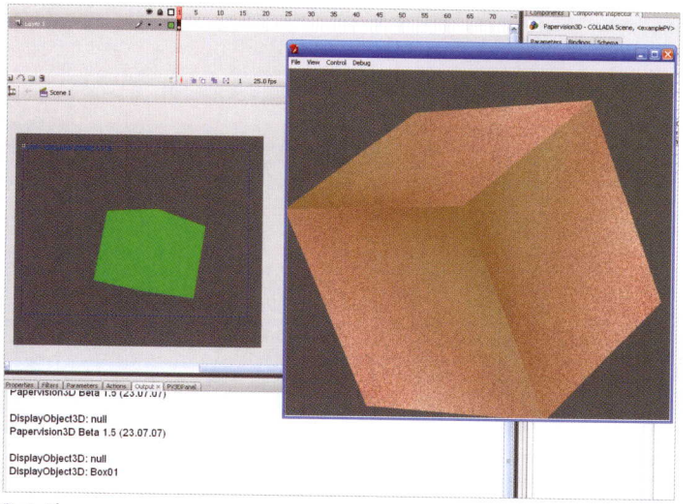
Click along to the **Camera** sub panel. The sliders control the camera's zoom, focus and Z value. Scrub along the **Zoom** slider and you'll see the green cube draw nearer to the 'camera'. Adjust the zoom and Z value until you can clearly see the green cube.

Clicking on the **Model** sub panel brings up a slider, which you can use to scale the model. There's also a rotational device that enables you to rotate the model in real time. The only use this actually serves is that whichever angle you set your 3D model at, this is the angle it will appear at when previewed on the stage.

The next sub-section to look at in the **PV3d** panel is **Tools**, which has a lot of great interactive uses. Here, you can select a template that will assist you in creating ActionScript for your Papervision project. Do this by selecting a code template. You have two options in the drop-down menu: one of these is to create a new class or code for timeline use. By selecting **Copy to clipboard**, this code can then be pasted into the **Actions** panel so that it can be modified later. Here's how:

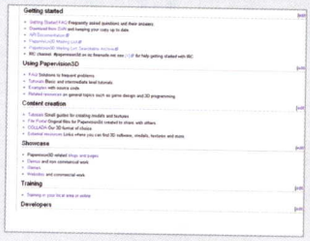
In the **Component Inspector**, if you have selected a material and changed its value setting from **Interactive** to **True** (in the **Value** pop-up box), you can uncomment out the following code from the code, which was copy-and-pasted into the **Actions** panel.

```
var my3DObject:DisplayObject3D = scene3d.collada.getChildByName("my3DO
bject");
```



Rotation Add mouse functions in the Component Inspector, then preview your changes by clicking Ctrl + Return. Move the 3D object pointer to rotate the cube

Resources Find out more about Papervision



Papervision3D Wiki
For the latest in Papervision news and downloads, this wiki page is the best place to go. Bookmark it for the latest Papervision updates, plus you'll also find FAQs, tutorials and related resources, including links to other Papervision-oriented sites.
wiki.papervision3d.org/index.php?title=Main_Page

3D Buzz
If your appetite has been whetted by the possibilities of producing your own 3D models for use with Papervision, then the 3D Buzz site should be your first port of call. With tutorials, discussions and news items, this site is packed with 3D wonderment.
www.3dbuzz.com/vbforum/sv_home.php

There are many resources on the web for finding royalty-free 3D models and textures

```
my3DObject.addEventListener(InteractiveScene3DEvent.OBJECT_CLICK,
handleObjectClick);
my3DObject.addEventListener(InteractiveScene3DEvent.OBJECT_OVER,
handleObjectOver);
my3DObject.addEventListener(InteractiveScene3DEvent.OBJECT_OUT,
handleObjectOut);
```

By changing the **my3DObject** references to your own object, you can customise this script to receive mouse clicks.

Also, within the **Component Inspector** you can instantly add click and rotate mouse functions by setting **Scene Rotation** to **True**. Hit **Ctrl + Return** to preview the movie.

You'll see a textured cube in the middle of the screen. Drag your mouse up and down, left and right to control the position of the 3D object pointer on this to rotate the cube in 3D space.

New PV3d releases

Papervision is in a constant state of development, with new features being added on a regular basis. There are some great new features in the next version of the PV3d component (at the time of writing these are still in Alpha development) including being able to use perspective-correct materials by setting a perspective flag on materials, which will dynamically tessellate a triangle to achieve perspective correctness.

If this tutorial has whetted your appetite for more information on Papervision, be sure to check the links listed in the Resources box, above, to find out more. On page 78, you'll find examples of inspirational Papervision sites, where you can see some of these Flash techniques in action. ●

About the author

Name Paul Wyatt
Site www.paulwyatt.co.uk
Areas of expertise Interactive web design, motion graphics and video
Clients *The X Factor*, Fanta, Smirnoff and Research Studios
What was your favourite school subject? Art, of course!

/create/importing a 3D model

To create more complex objects in Papervision, import models created in 3D modelling apps. **Carsten Schneider** and **Patrick Juchli** of Less Rain show you how

Knowledge needed	AS3, Subversion, 3D Modelling
Requires	Flex Builder, 3D modelling software, Collada export plug-in
Project time	2 hours

When we were developing the Red Bull Flugtag Flight Lab site (www.redbull.com/flightlab/) for Less Rain, we found Papervision3D invaluable for 3D modelling.

Papervision3D offers some simple primitives such as cubes, cylinders or spheres for quickly testing out different techniques that include handling objects in space and applying materials to them.

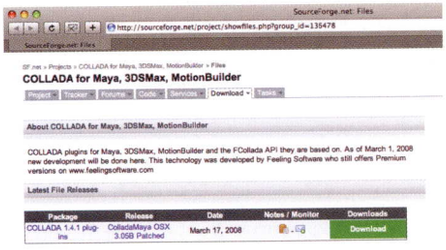
After that there are two ways you can create more complex objects. Either you build them dynamically by writing code or you import whole models that have been created in a 3D modelling application.

In this tutorial we're going to take a look at importing. Papervision3D lets you import a whole number of file formats, such as Collada, models using the standard format from 3ds Max or even models used in Quake (MD2).

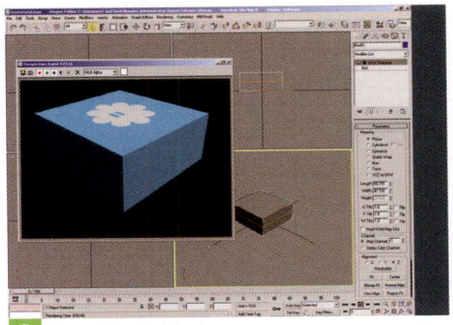
We're going to focus on Collada because this format has the best support in the current version of Papervision3D. Importing has been greatly improved in the latest Papervision3D and you'll soon be able to import animations from your 3D modelling application too.

Expert tip Why use a modeller?

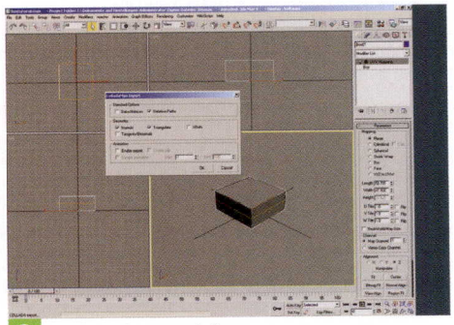
The advantage of creating your models in a modeller is that you can optimise a model according to your specific needs. Depth-sorting, for example, is a common problem in Papervision3D – something that should be behind another part of an object might overlap depending on camera position. Using a modeller you can optimise the problematic parts of your model by locally enhancing the mesh detail of your 3D object. Or if, for example, you have a complex object and you only show it from one side, you can remove unused mesh data and enhance performance.



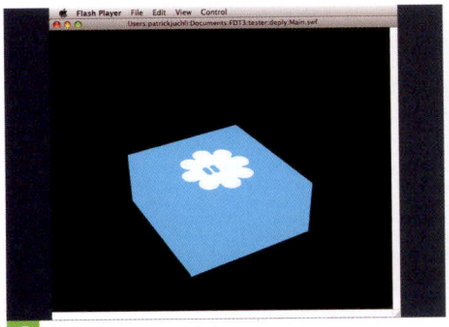
START Initial preparation If you're using Maya or 3ds Max you can use an export plug-in by Feeling Software (www.feelingsoftware.com). Next, you need the latest Papervision3D version, GreatWhite, from Subversion: code.google.com/p/papervision3d/source/checkout.



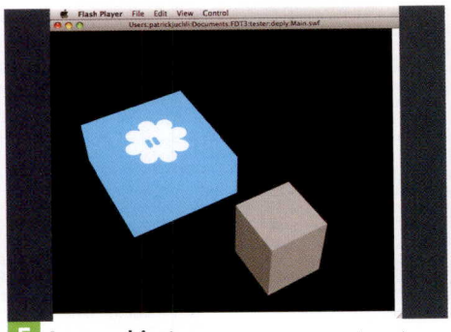
2 Create an object Launch your 3D application, for example 3ds Max. In there, create a simple box. Apply a bitmap material using planar mapping. You can also move the mapping and rotate it. Papervision3D is able to import this information later. Next, name your object **MyCube**.



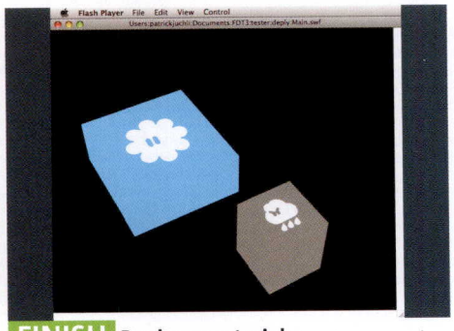
3 Export the model In this tutorial we're using the ColladaMax plug-in for 3D Studio Max. Choose **Export...** and **Collada (*.DAE)** as the file type. Opt for **Save** making sure you have the following settings in the dialog window – **Relative Paths**, **Normals**, **Triangulate** – set to **yes**.



4 Import the model Set up a scene in Papervision3D, name it **myPapervisionScene** and import the object by using these lines: **var myImportedModel: DAE = new DAE("filename.dae"); myPapervisionScene. addChild(myImportedModel)**. You should see the model.



5 Access objects You can now move, scale and rotate the model. If your model is made up of several small objects you can also access them. Say we created a SmallCube next to the original cube, we could access it like this: **myImportedModel.getChildByName("SmallCube")**.



FINISH Replace materials Here's an example of replacing the original material with a red wireframe: **var myWireframeMaterial:WireframeMaterial = new WireframeMaterial(0xFF0000); myImportedModel.replaceMaterialByName(myWireframeMaterial, "OriginalMaterial")**.

/create/integrate video into Papervision

Peter Schirmer of San Francisco-based agency Odopod walks you through a simple technique for integrating video into a Papervision3D scene

Knowledge needed ActionScript 3

Requires Flash, Papervision Codebase

Project time Less than an hour

Our Speak Visual project for NVIDIA (www.speakvisual.com) centred around the idea of integrating video content into a 3D space. Based on our experience with this site, the following tutorial will walk you through one simple technique for integrating video into a Papervision3D scene.

Papervision3D is fairly complicated and learning the ropes can take a while. Luckily, there are plenty of tutorials and other resources available online, as well as a very active developer community that regularly contributes to the project. A great place to start is dev.papervision3d.org.

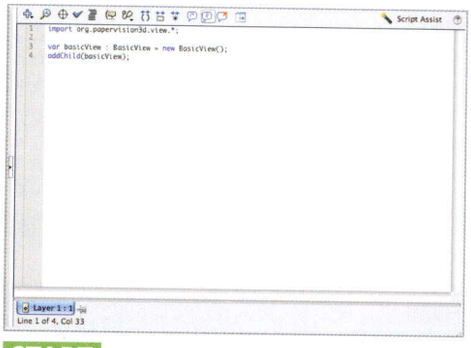
There are many ways to work with video in Papervision, including streaming or progressively loading external FLV files. But for the sake of simplicity in this tutorial, we'll just have a go at embedding our video in the timeline of a movie clip in the library.

We'll go on to create animated material using that movie clip for the texture and then apply that material to a plane in our 3D scene. For best results, you may need to adjust your video quality or size, adjust the render quality within Flash or change the settings within Papervision itself.

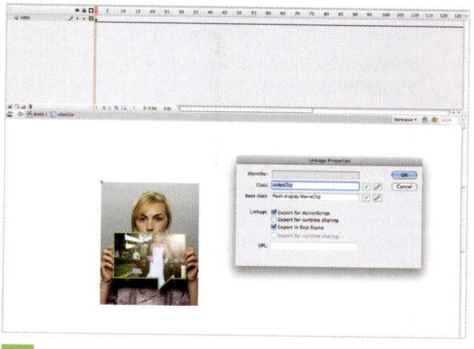
Expert tip Render quality

To get the best rendering quality, we set the **stage.quality** property to **StageQuality.BEST**, and the **smooth** property on the **MovieMaterial** to **true**. You can also increase the number of segments on your plane to get a better looking 3D rendering. This will be most noticeable as you rotate your video.

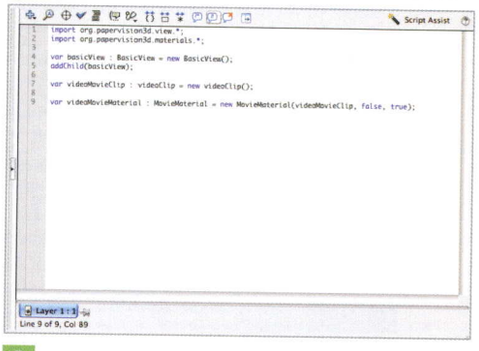
Remember that as you add more 3D objects or segments to your scene, you may have to cut back on quality or limit the number of simultaneously playing videos to keep your frame rate up.



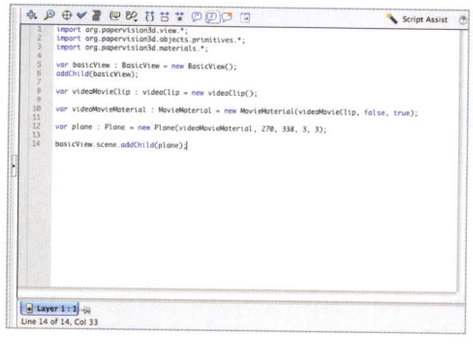
START Preparation Navigate to code.google.com/p/papervision3d/ and follow the instructions. Once you have the library, set up a scene by using the **BasicView** class. Import the class into your code, create a new instance of **BasicView** and add it to the stage.



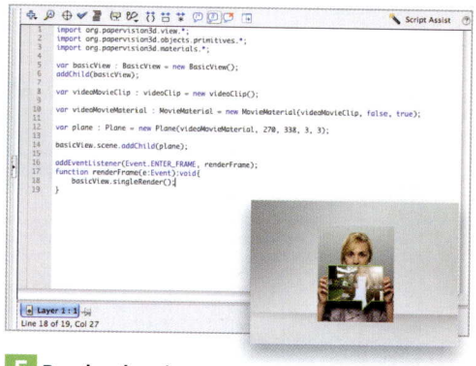
2 Add video to your project Import your FLV video into the timeline of a new movie clip. In the linkage settings, set the movie clip to export for ActionScript and give it a unique class name. In your code, create an instance of your movie clip.



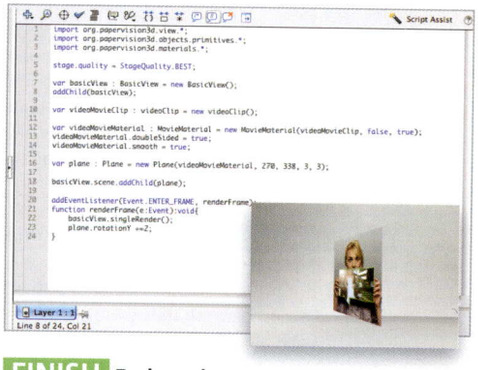
3 Create a MovieMaterial Import the **MovieMaterial** class into your code and create a new instance. The second parameter (the first is in step 2) is for transparency. Set it to **false** unless your video has an alpha channel. Set the third parameter for animated to **true**.



4 Make a plane Import the plane primitive object. Create a new plane object using the material you created in step 3 and give it a width and height that match your clip. To add it to the scene to be rendered, find the scene object and use **addChild** like you would any other display object.



5 Render the view Before anything will show up, you still need to render the view. To do this, create an **enter frame** loop that calls the **singleRender** function from the **basicView** instance. If you publish now, you should be able to see your video playing on the stage.



FINISH End result To see that you have a real 3D object, add some rotation. In your render loop, add a call to change the **rotationY** property of your plane. To see the back side of the plane as it rotates around, set the **doubleSided** property on your **MovieMaterial** to **true**.

location Flash Camp London

Where next for the Flash platform?

Exclusive As part of Flash Camp in London, .net met up with Adobe and five Flash experts to discuss the power of the community and the new challenges the platform is facing

Andrew Shorten, Adobe How has the business market's perception of Flash changed?

Stefan Richter, Muchosmedia There's certainly a shift. I don't work on the timeline in Flash much at all these days. Clients come to me for consultancy, whether it's configuring servers or evaluating the Flash platform against other technologies. There are many different levels and with Flex certainly it's become more acceptable. It's way beyond the banners and skip intros. If you want to make a business out of it, there are so many different levels. It comes down to what you want to specialise in.

Dave Williamson, BitTube I think the advent of Flex Builder has opened up people's opinions. Previously, there were a lot of preconceived ideas about what Flash is. People had this idea that it's a banner machine, an advertising platform, a microsite thing – very limited in its capabilities. Flex Builder has changed this attitude an awful lot as banks have started to use it, and certainly Java developers are actively pursuing the use of Flex.

James Whittaker, Refreshingapps The business used to perceive Flash as some people creating quick fancy graphics that had animation in them, things that you added on to the site to draw people to it. Flex has really opened up the game and the businesses have started to understand that it's a proper platform now. We can do proper RIAs, we can now deliver these to the desktop as well, which we never could before. We're getting more into an application space now rather than just brochureware sites. Where the Flash platform is going is absolutely fantastic. Businesses have started to take note and it's definitely heading in the right direction.

Mike Jones, FlashGen If you look at financial services and internal systems, a lot of those dashboard solutions that they had in the past were Java-based because they were spewed out from the back of the services. They delivered the information, but may not actually deliver the experience. If something works but only works good enough, then people will use and tolerate it but it doesn't necessarily mean it's right for them. With the Flex framework and the ability to then harness the Flash platform technologies to deploy to the desktop through AIR, it gives you a very clean workflow for being able to introduce that rich user interaction without actually sacrificing time, cost or functionality.

Bola Roibi, MWD Businesses, as opposed to your typical digital agencies, are much more formalised because I guess they have got compliance issues they have to meet. They need to have a set process, which is something that to a certain extent has always been missing between the traditional digital agency work and how it fits into corporate business.

JW I think you're quite right there. I've worked on a financial enterprise Flex application and the company wanted to be the first to market with an RIA and we chose the Flash platform to do it. The way it was actually built wasn't with a creative workflow at all. It was very, very structured. It was done with Agile development methodologies.

AS A key part of moving the platform on is the community. What inspires you in the community?

DW I don't know whether the Flash community is unique as I've never heavily been involved in other communities but it's certainly so enthusiastic. It's prepared to just have a go at stuff and isn't afraid to fail. The open source Flash movement, for example, shows how fearless a lot of Flash developers can be. Maybe some would say it's blindly fearless but actually an awful lot of good comes out of it. The work that goes into things like Papervision, these are things that are driven by the community's blind drive into accomplishing something. The results are incredible.

MJ Just recently I was doing some work with a company and they showed me one of their layout planning tools for magazine publication and it's all built in Flex. They have their own version of Flash Media Server that they wrote on the back of it. It's truly astounding to see this product. If it didn't have a web browser chrome around it, you would just make the assumption that this was a real hardcore desktop application, and that's >>

Flex-ible Flex offers new opportunities to introduce rich user interaction, says Mike Jones

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Photography/Andy Short

Dividing line "Fragmentation across devices is the biggest barrier for me" – Dave Williamson

Changing times There was a consensus that the industry's attitude to Flash has shifted markedly

>> not taking away from the technology and the implementation. You just see this thing and think that's just too cool.

AS Inspiration can come not just from whizzy graphics or rich UIs but also from the quality and the stability in which something's produced.

JW Back in the day there was a lot of crazy Flash stuff with really small fonts, some attempted applications you really couldn't use. I think we've evolved and picked up some really good stuff from other companies that have done hardware and software. Flex as well has given us a good platform to begin a really good experience in applications. The Fiat Eco Drive (www.fiat.co.uk/ecoDrive), for example, is a complete proper application with all the nice design stuff but there's an awful lot of things going on behind the scenes.

SR The tool itself has so many levels. All of us here do something different with it, whether it's mobile or Flex components or AIR apps. I've worked with

> "Flash has so many levels, it's a real Swiss army knife. I don't know of any other tool that has that sort of depth to it" Stefan Richter

Flash as far as I can remember and I've probably just touched half of it, probably not even that. It's a real Swiss army knife and you get all these creative people who see it as something different. Nobody has the same perspective. I think that's what makes the community so unique. I don't know any other tool with that sort of depth to it.

BR Do you think there's a type of person that suits the Flash community?

DW At Flash on the Beach last year they asked how many people came from a standard computer sciences background and quite a few hands went up. Then they asked how many people came from a creative background and it was about 90 per cent of the people. There's this drive for creativity in what we do, even if we put it in a text editor. It's almost like asking a kid 'what do you want to do when you grow up?' and they say 'I'd love to work at Legoland'. Twenty years later here I am working in Legoland building stuff every day.

MS I think that you'll probably find that the vast majority of people who are Flashers all really got off on Lego or Meccano if you're as old as I am. Because you have to have a slightly analytical perspective to be able to visually see and hold that mental form in your head and extrapolate it out. You also have to have a very creative leaning because you're talking about creating something that is inherently visual. I think we are fast approaching a point where the Flash platform may start to resemble the Java platform in the sense that people will start to specialise in particular routes. You start off being a generalist and then you start to focus on a specific area based on the career path you want to follow.

AS Where you want the platform to go next?

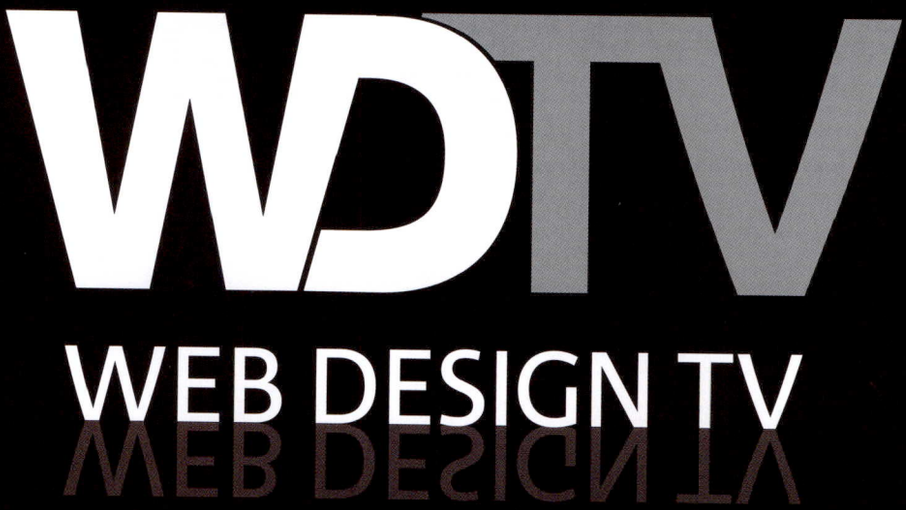
SF I'm passionate about the real time aspect. A lot of other technologies haven't really grasped what having real time features can do to an application. Adobe is suggesting an order form, for example, and that's great but again it's about convincing the people higher up the chain. Who's actually going to change their whole ordering process or that checkout page to a Flash page? At the same time, those people that recognise the ideas that can be had will be the first to benefit from it.

DW For me the most important thing is borne out of what I've been doing the last two years around mobile. I'm not able to use AS3 or Flex, or any of these fun powerful systems. The fragmentation across devices of the player and platform is the biggest barrier for me and I want consistency of the platform, consistency of the way it updates and consistency of the APIs.

JW I'm coming from the AIR side, and it's great where it is now on the desktop but it also has a lot of limitations on the desktop. As soon as we hit devices as well and developers can start developing apps and sites that are going to work on mobile and on the desktop and do all these fabulous things with integrating with other programs lower down in the systems – that's going to open up a whole new world than just Flash inside the browser.

MJ I like to see the Flash platform on everything but there needs to be some form of consistency across the board for that to happen. We as a community and as a technology are mature enough now to be able to make decisions over whether the code execution is going to crush a person's system and we don't need the Flash player to step in and tell us that. ●

WWW. *To listen to the discussion in full, check out episode 40 of our WDTV podcast on iTunes*



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/Flash/make scrolling animations

Create cool animated effects in Flash without any need for timeline tweening. **Paul Wyatt** demonstrates how to scroll content across the screen by the power of code alone

What you'll learn Paul Wyatt gets you up and running with this introduction to the powerful Flash tween class. Fancy improving your Flash animations? Want to do it without any timeline tweening? Well this is the tutorial for you!

Knowledge needed: Understanding of Flash CS3
Requires: Flash CS3, Photoshop CS3
Project time: 30 minutes

We all like the idea of being an animator in theory. Unfortunately, in the real world, we can't all be Mr Hanna or Barbera. But for those of you who just want nicely realised animated effects in your Flash work, the good news is that you need look no further than the application itself.

Packaged with Flash CS3 and lurking on your hard drive are the Flash tween classes. With these you can easily add animation effects for your Flash movie clips. Transitions, tweens, easing in, out, bounce effects ... the list goes on. And one thing's for sure: they're fun and easy to use.

In this tutorial we'll put together a piece of animated content using some snazzy video buttons and the Flash tween class to scroll the content across the screen. But we won't be touching the timeline. All the animations use nothing but code.

After working through this tutorial you'll be ready to try out the tween class in your own projects.

You may not be the next Walt Disney or Hayao Miyazaki, but Flash is there to give you a great big animated hand. So come on, what are you waiting for? ●

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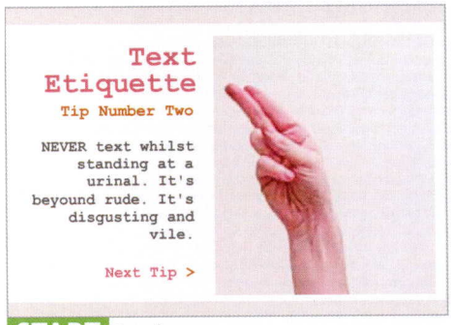
Expert tip Experiment further

We've only used the X-axis for our animation here, but of course you can experiment with using the tween class on the Y-axis as well.

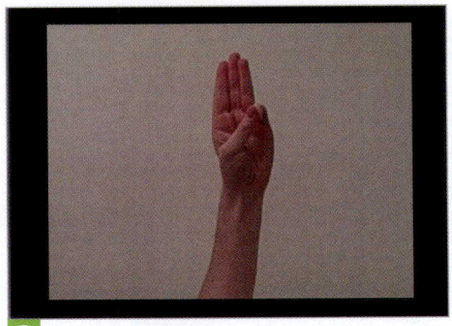
We've also only used one animation option from the tween class. There are many more animation types as well as transitions for you to try out.

Remember, though, that too many transitions will make your work look a little cheesy.

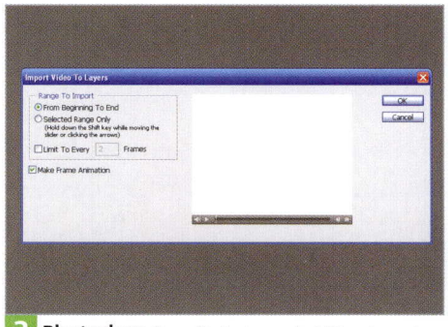
In general, your transitions and animation types should strike a balance with the content you're trying to promote.



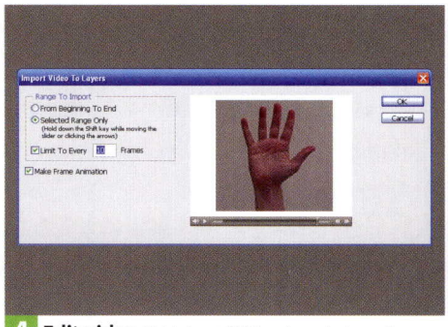
START **Preview** Open **finalanimation.swf** on the disc. An animated hand will point to the first pithy Text Etiquette tip. Clicking anywhere on the movie will cause the second Text Etiquette tip to scroll in and the first to scroll out. Click through to see all the tips.



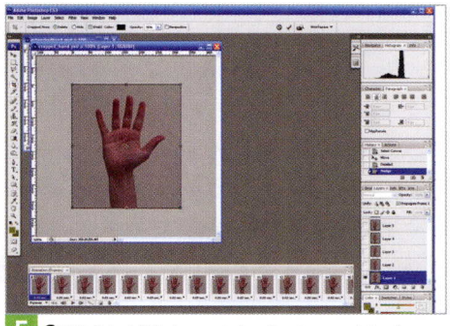
2 Flip video Our hand animations were created using a Flip video camera (theflip.com). This creates pre-optimised video, which is low in file size and easy to work with. We recorded a sequence of hand movements recorded against a white background (see **hand_video.AVI** on the disc).



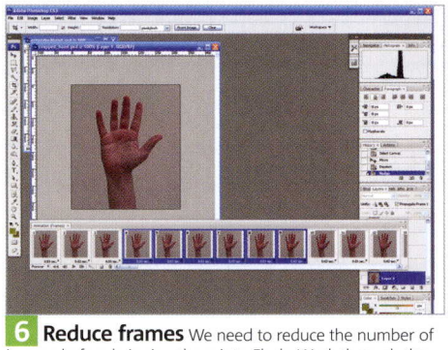
3 Photoshop Open Photoshop; select **File > Import > Video frames to layers**. Browse to the file **hand_video.AVI**. The **Import Video to layers** box will appear. Check the radio box for **Selected range only** and check **Limit to Every**. Enter a value of 10 for frames. Check **Make frame animation**.



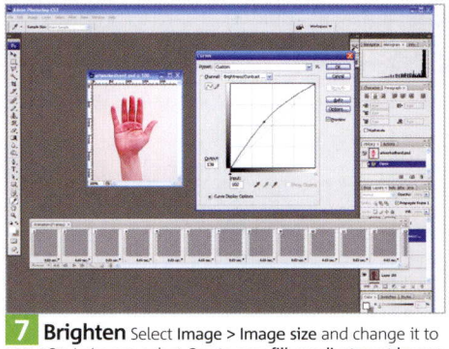
4 Edit video Hold down **Shift** and scrub along the **Import Video to layers** preview window a little in from the start of the movie to remove the early set-up frames of moving the hand in and out. Select all portions of the movie that are to be featured in the Flash animation. Click **OK**.



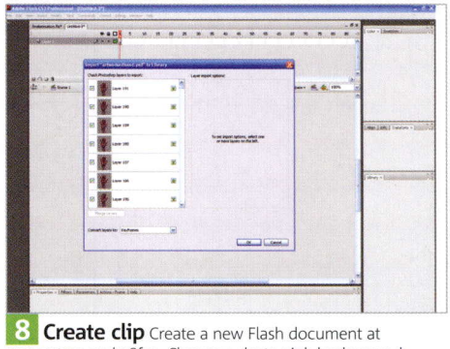
5 Crop Select **Window > Animation** to reveal the frames for the hand animation. Hit the play icon in the animation panel to check how much room the animation takes up as the hand moves from left to right. Hit **C** to select the **Crop** tool. Crop in to remove excess white space around the hand.



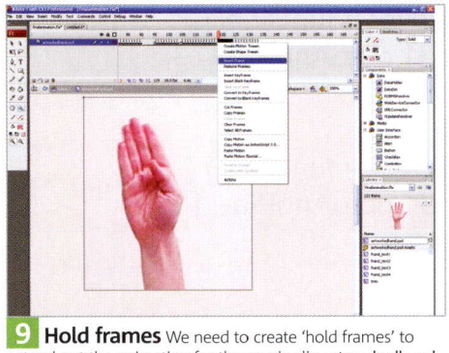
6 Reduce frames We need to reduce the number of images before bringing them into Flash. Work through the animation panel and Ctrl-click redundant or duplicate frames. Once selected, hit the dustbin icon on the animation panel to delete them.



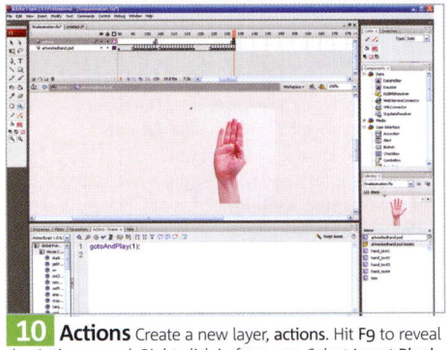
7 Brighten Select **Image > Image size** and change it to 250x285. In **Layers**, select **Create new fill or adjustment layer > Curves**. Click and drag the curve upwards to brighten up the image. In the **Channel** options, select **Red**. Click and drag the curve to add more red. Click **OK**. Save as **artworkedhand.psd**.



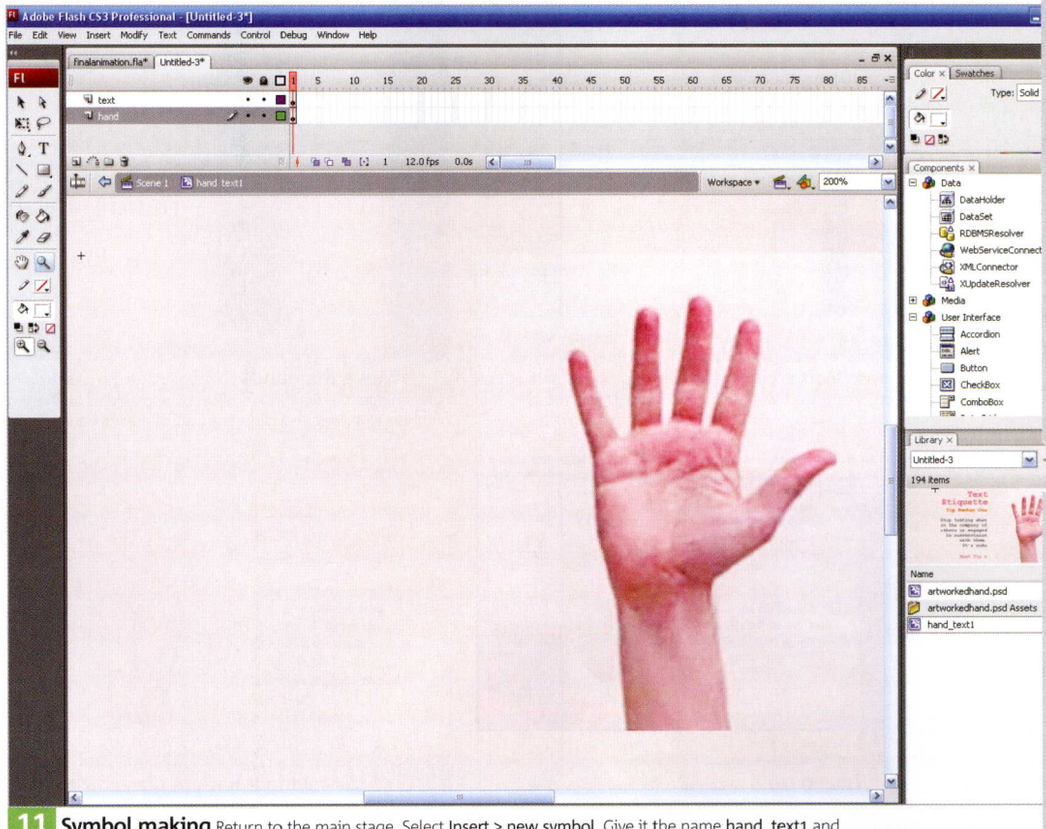
8 Create clip Create a new Flash document at 550x350px and 18fps. Choose a dusty pink background. Select **File > Import> Import to library**. Select **artworkedhand.psd**. In the **Import "artworkedhand.psd" to library** box select all layers and choose **Convert layers to: Keyframes**. Hit **OK**.



9 Hold frames We need to create 'hold frames' to extend out the animation for the movie clip **artworkedhand.psd**. Double-click this in the library. Right-click in frame 29. Add two frames. Add two more at frame 36; three at frame 62; five at frame 90; one at frame 104; and six at frame 118.

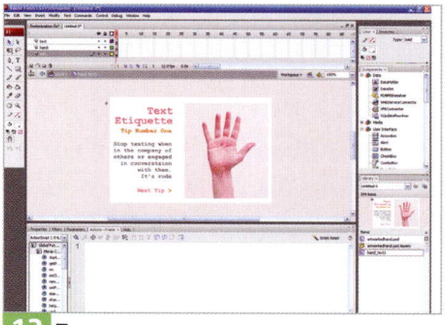


10 Actions Create a new layer, **actions**. Hit **F9** to reveal the **Actions** panel. Right-click in frame 15. Select **Insert Blank keyframe**. Click in **Actions** panel. Type **gotoAndPlay(1);**. Repeat at frames 18, 72, 104 and 133 (numbers may differ depending on how many frames you removed in step 6).

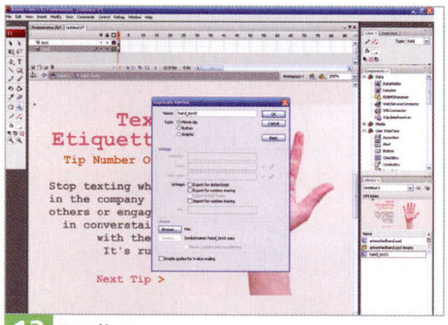


11 Symbol making Return to the main stage. Select **Insert > new symbol.** Give it the name **hand_text1** and **Type** as **movie clip**. Drag an instance of **artworkedhand.psd** into this new movie clip. Name this layer **hand**. In the properties inspector, give this symbol the instance name of **hand1**. Create two more layers – **type** and **trim**.

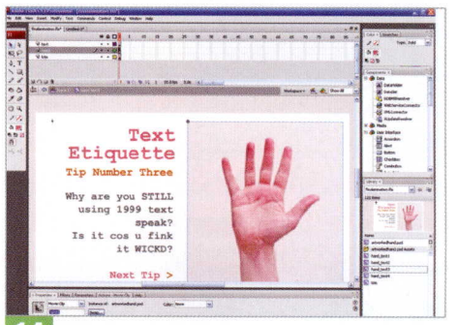
>>



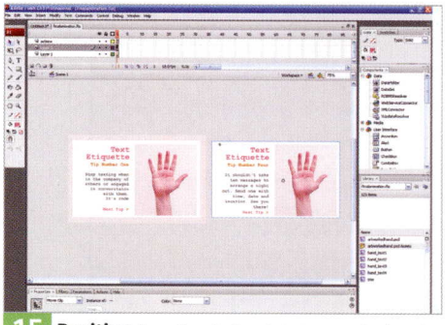
12 Type Hit T for the **Type** tool. We've used Courier to add out text and aligned all the text to the right. Enter your text here or copy and paste the text found in **finalanimation.fla**. Select the rectangle tool and click and drag in the trim layer. Draw out a white rectangle behind the hand and type.



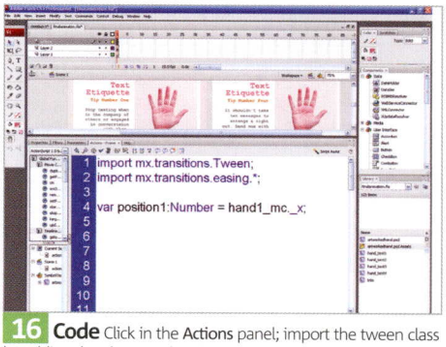
13 Duplicate Right-click the movie clip **hand_text1** and select **Duplicate** from the menu. In the **Duplicate Symbol** box, name it **hand_text2**. Repeat this twice more, naming the duplicates **hand_text3** and **hand_text4**. Open each clip and change the type layers so they have different copy.



14 Instancing Within each duplicate movie clip, also change the hand instance names, in the properties inspector, so that they become **hand2**, **hand3** and **hand4**. Return to the stage, rename the default layer hand animations and create a new one named **actions**.

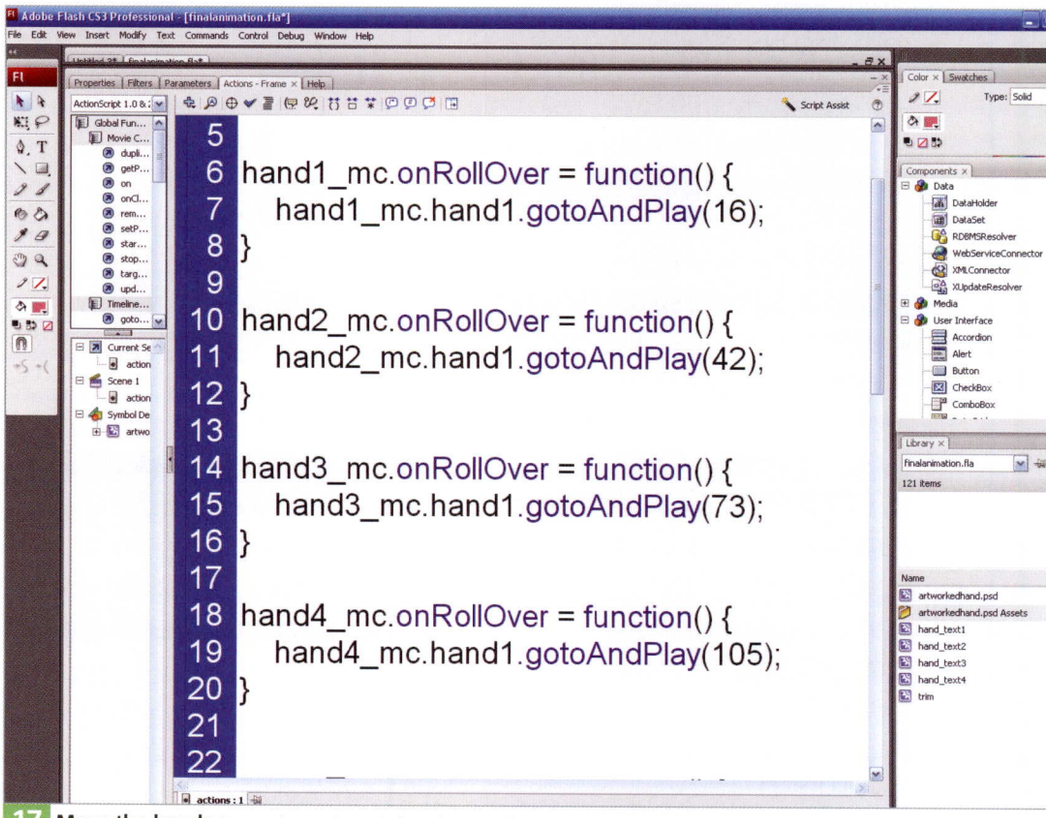


15 Position Drag the clip **hand_text1** onto the hand animations layer. Position at **X: 47.3, Y: 35.5**. Give this clip the instance name of **hand1_mc**. Drag the remaining **hand_text** movie clips and stack them at **X: 572.3, Y: 35.5**. Give each instance names of **hand2_mc**, **hand3_mc** and **hand4_mc**.



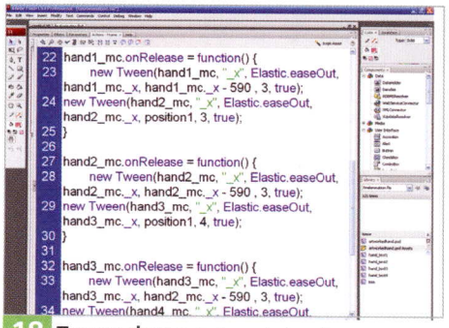
```
1  import mx.transitions.Tween;
2  import mx.transitions.easing.*;
3
4  var position1:Number = hand1_mc._x;
```

16 Code Click in the **Actions** panel; import the tween class by adding the above code. Also add a variable (position1) to remember the position of the first Text Etiquette tip so the three others occupy the same position when they're animated in. You can copy this code from lines 1-4 of the completed project.



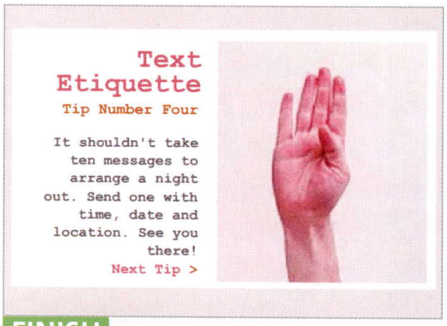
```
5
6  hand1_mc.onRollOver = function() {
7      hand1_mc.hand1.gotoAndPlay(16);
8  }
9
10 hand2_mc.onRollOver = function() {
11     hand2_mc.hand1.gotoAndPlay(42);
12 }
13
14 hand3_mc.onRollOver = function() {
15     hand3_mc.hand1.gotoAndPlay(73);
16 }
17
18 hand4_mc.onRollOver = function() {
19     hand4_mc.hand1.gotoAndPlay(105);
20 }
21
22
```

17 Move the hands Copy and paste the code from lines 6-20 from the completed project to add functions to the hand animations. On mouse rollover, the playhead on the movie clip **artworkedhand.psd** will move to different frame numbers to show the appropriate part of the animation for that clip.



```
22 hand1_mc.onRelease = function() {
23     new Tween(hand1_mc, "_x", Elastic.easeOut,
   hand1_mc._x, hand1_mc._x - 590 , 3, true);
24 new Tween(hand2_mc, "_x", Elastic.easeOut,
   hand2_mc._x, position1, 3, true);
25 }
26
27 hand2_mc.onRelease = function() {
28     new Tween(hand2_mc, "_x", Elastic.easeOut,
   hand2_mc._x, hand2_mc._x - 590 , 3, true);
29 new Tween(hand3_mc, "_x", Elastic.easeOut,
   hand3_mc._x, position1, 4, true);
30 }
31
32 hand3_mc.onRelease = function() {
33     new Tween(hand3_mc, "_x", Elastic.easeOut,
   hand3_mc._x, hand2_mc._x - 590 , 3, true);
34 new Tween(hand4_mc, "_x", Elastic.easeOut,
```

18 Tween class Paste the code from lines 22-40. Functions are attached to each movie clip to invoke the tween class to move the movie clip -590 pixels off to the left of its current position over a total of three seconds. This uses the Elastic.easeout animation tween class type.



FINISH Moving it back in place The second part of the function to move the next movie clip back to position1 – in effect, to replace the outgoing movie clip with the next one. This happens over a period of three seconds. With the code in place, hit **Ctrl + Enter** to preview.

Expert tip Stacking clips

The reason we stack out movie clips on the stage is to make sure they have the same distance to travel when they're animated via the tween class.

If the four-stage movie clips were placed next to each other, on the stage, this would break the animation flow. Movie clip number four would have further to travel to reach the position number 1 occupied. A 'gap' would appear while we waited for it to show up!

Stacking the movie clips is a good way to resolve this problem.

Liz Keller on ...

Indexing Flash files

Conchango's SEO guru **Liz Keller** asks whether Google's inroads into indexing Flash files is good news for the searching public, and how it will change the way companies deliver web projects

Deep below the surface of most web agencies lies an incredibly powerful technique. But you won't find it in any textbook, or listed on the 'Our 86-stage process' pages of any agency website. It's what we like to call 'the mum test'. What agencies, and site owners for that matter, ask is: "Yes, this would seem to work perfectly in all traditional scenarios, but could my mum use it?"

And so it was with some trepidation that we received the announcement that Google would be flinging open the doors of the world's collection of Flash sites.

The problem is not that enriching the big G's search index with ever more data to be crunched and rated is a bad thing.

It's more a question of whether much of that content was ever really designed for public consumption, and how much thought was put into working out how it should be used if it ever was found.

I'm not just thinking of all of those 'graphic goes here, John'-type instructions that might suddenly end up floating to the surface of our search engine results pages, but all the content that was intended to be there – which in reality only Google is ever going to be able to find. And this is particularly worrying when it comes to 'the mum test'.

The problem becomes more serious when you consider the accessibility implications for those who may simply be unable to view the content they've been directed to by Google.

The quality of additional search results relies on Flash developers going through the same learning curve as their HTML brethren did almost a decade ago. For years, many Flash developers have been insulated from these questions by Google's refusal to index their files, meaning that an accessible version (for humans and spiders) was typically included alongside the Flash content.

Flash developers now need to learn about content creation and maintenance strategies, structured data, key word relevance and density, analytics, link style and good coding practices.

And that's all before we have even considered what will happen when Google starts to pull the rug from underneath unsuspecting developers, perhaps changing algorithms or blocking file structure and techniques perceived to be unscrupulous or 'black hat'.

> "How much of that content was ever really designed for public consumption?" Liz Keller

But these are challenges that can be overcome. What we're talking about is no less than the need for design patterns to emerge to enable accessibility and usability. As well as for conventions to emerge in coding techniques and practice, in a discipline which has up until now become popular through its deregulation and freedom of expression.

And what can we make of Google's intentions? For a company that cares so much about the quality of results, the shift feels somewhat out of character. Are they intending to force the same discipline on the rich media world that they've achieved in the realms of HTML?

It may be worth noting that this announcement came hot on the heels of the news that the search giant would be adding video or cartoon content to its adSense distribution network, and had sown up rights from *Family Guy* creator Seth MacFarlane to do just that. However, while these assets may be Flash, none of these files will be indexed because of the way they're added to the page. Nor will Google be able to expose any more of the content delivered by its YouTube or Google Video channels.

Perhaps the strategic intent is merely to shut the door on competitors getting there first. Or maybe it's simply the output of a developer's spare time as part of Google's famous 70:20:10 scheme, which allows staff to spend time on pet projects.

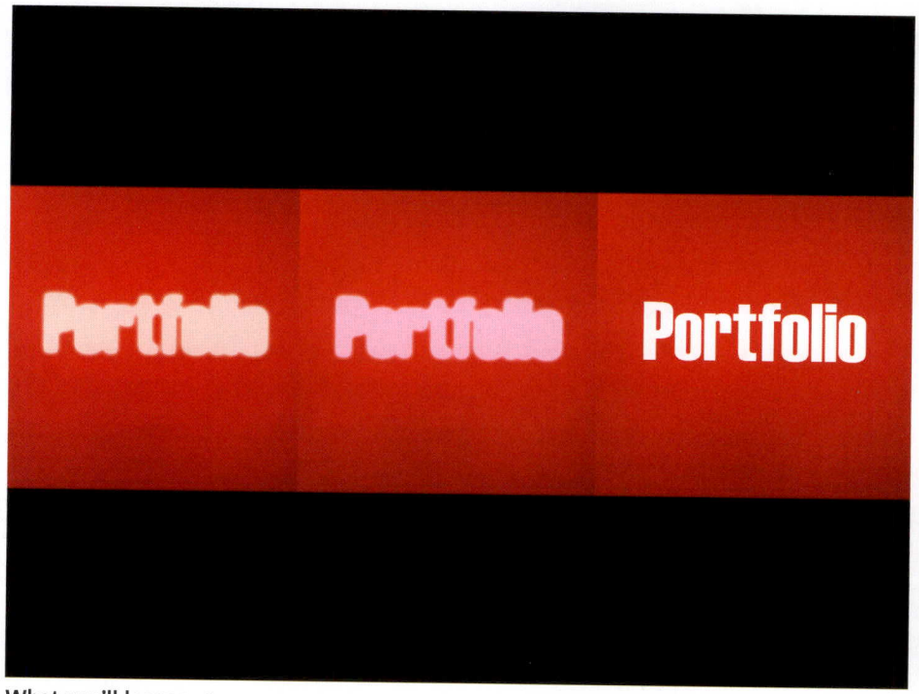
While it's too soon to say what impact Google's change will have on search, it certainly has the potential to open up huge opportunities for designers once the initial barriers have been overcome. Publishers can finally take advantage of the promise of rich internet applications and transfer those skills to other spiderable rich application platforms such as Microsoft's burgeoning Silverlight technology. But before they can do that they, along with Google, will have to accept they have a lot to learn.

Liz Keller is a senior business consultant specialising in search engine optimisation. She has eight years' SEO experience, having previously worked in New York for several major digital media companies and online content providers before moving to London and joining Conchango (www.conchango.com).

/Flash/animation with ActionScript 3.0

Your essential CD
All the files you'll require for this tutorial can be found on the CD.

Pushed for time? Deadlines looming? Learn to copy tweened animations to ActionScript and you can save yourself hours of effort. **Paul Wyatt** demonstrates this handy technique



What you'll learn Paul Wyatt shows you how to copy Flash animation to ActionScript 3.0 code. That's reusable code that can then be applied to any movie clip in any ActionScript 3.0 movie – a real time-saving technique that will help you deliver your Flash creative on time

Knowledge needed Understanding of Flash CS3
Requires Flash CS3
Project time 30 minutes

We all need to save time. There are never enough hours in the day, and when it comes to deadlines, anything that puts us ahead is a very welcome thing.

In Flash, keyframing animations and producing motion tweens can be a laborious process – particularly if you have to create the same style of animation over different movie clips across several Flash movies.

This can be a massive drain on resources. It's a case of going back to the drawing board and starting the animation again.

Or is it?

One of the best features to come along in Flash CS3 is the ability to copy tweened animations to ActionScript 3.0. This way, you're able to take your finessed animation efforts and convert the animation to ActionScript code.

This code can then be reapplied to any Flash movie clip – in any Flash movie. An instant time-saver in only a few clicks.

Sounds too good to be true? Well don't worry, there's no catch: just a straightforward technique that could put you ahead of the game when it comes to delivering client creative. Read on to find out how to put it into action.

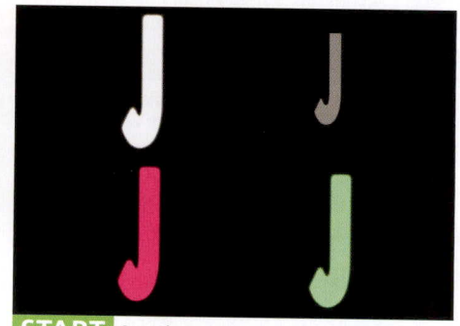
About the author

Name Paul Wyatt
Site www.paulwyatt.co.uk
Areas of expertise Interactive web design, motion graphics
Clients Smirnoff, Fanta
Favourite crisps flavour Banana

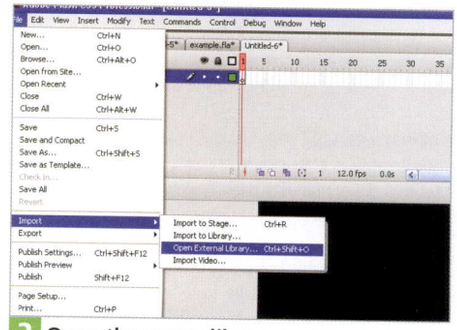
Expert tip How long?

Your motion tween can be as long as you like, provided it's on a single layer. It can contain multiple tweens and keyframes, as well as blank and 'hold' keyframes. Animated filter effects can also be included, as well as Alpha and scale effects.

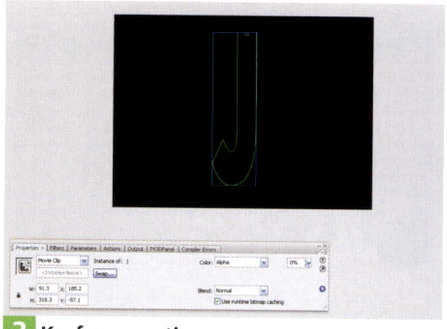
You can capture the motion of a number of Motion tween properties. These are: Transformation point, Colour, Skew, Scale, Rotation, Position values, Filters, Custom easing, Cache as Bitmap setting, Blend modes, Position, Orientation to motion paths, Frame labelling and Motion guides.



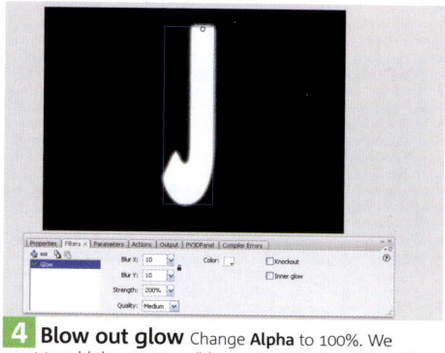
START Starting up Open **animation.swf** from the CD to preview what we'll be making. Create a new ActionScript 3.0 document in Flash. Make it 550x400 pixels and use a frame rate of 25 frames per second. Change the background colour of the movie to black.



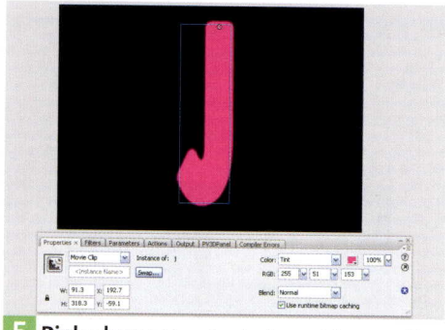
2 Open the assets library Double-click on the name **layer 1** of the default first Flash layer and rename this **animation**. Select **File>Import>Open external library** and choose **assets.fla**. Drag out an instance of **jsymbol** onto the **Animation** layer. Position this at the centre of the stage.



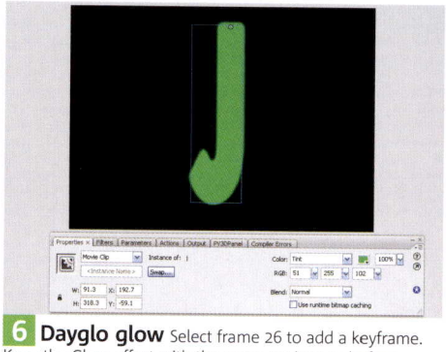
3 Keyframe options Select the default keyframe at frame 1 and select the **jsymbol** clip. In the properties inspector, select **Color** and drop down the menu options. Select **Alpha** and in the percentage slider next to it, change this to **0%**. At Frame 13, add a new keyframe.



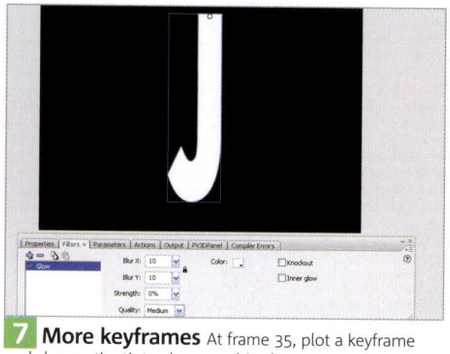
4 Blow out glow Change **Alpha** to 100%. We want to add the start to a 'blow out'-style glow. Select the **jsymbol** clip and in the **Filters** tab drop down the **+** and select **Glow**. In **glow parameters** make **Blur X** and **Blur Y** 10%, **Strength** 200%, **Quality** medium and **Color** white.



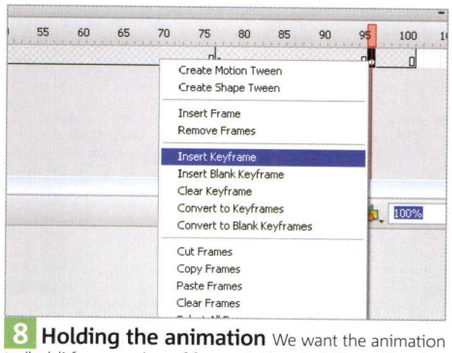
5 Pink glow Add another keyframe at frame 20. Keep the Glow settings as before but change **Strength** to 500%. Keep **jsymbol** selected, move to the properties inspector, drop down the **Color** option and select **Tint**. In the **colour RGB** option, enter the values **R: 255**, **G: 51** and **B: 153**.



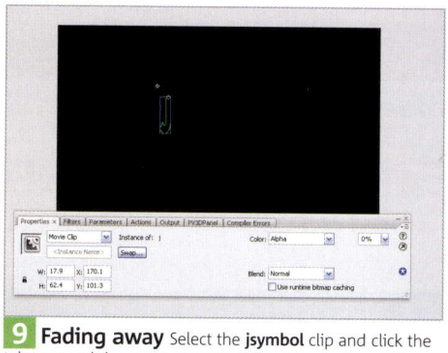
6 Dayglo glow Select frame 26 to add a keyframe. Keep the Glow effect with the same settings as before, apart from **Strength**, which is now set to 250%. In the properties panel, change the **Tint** to RGB **R: 55**, **G: 255** and **B: 102**. The clip will now become a bright green colour.



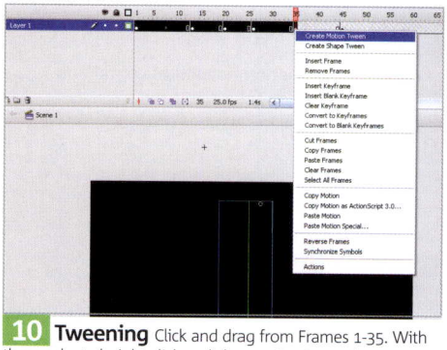
7 More keyframes At frame 35, plot a keyframe and change the tint colour to white (**R: 255**, **G: 255** and **B: 255**). Keep the Glow effect with the same parameters as in the previous steps but make **Strength** 350%. Finally, at frame 45, add a keyframe and change **Strength** to 0%.



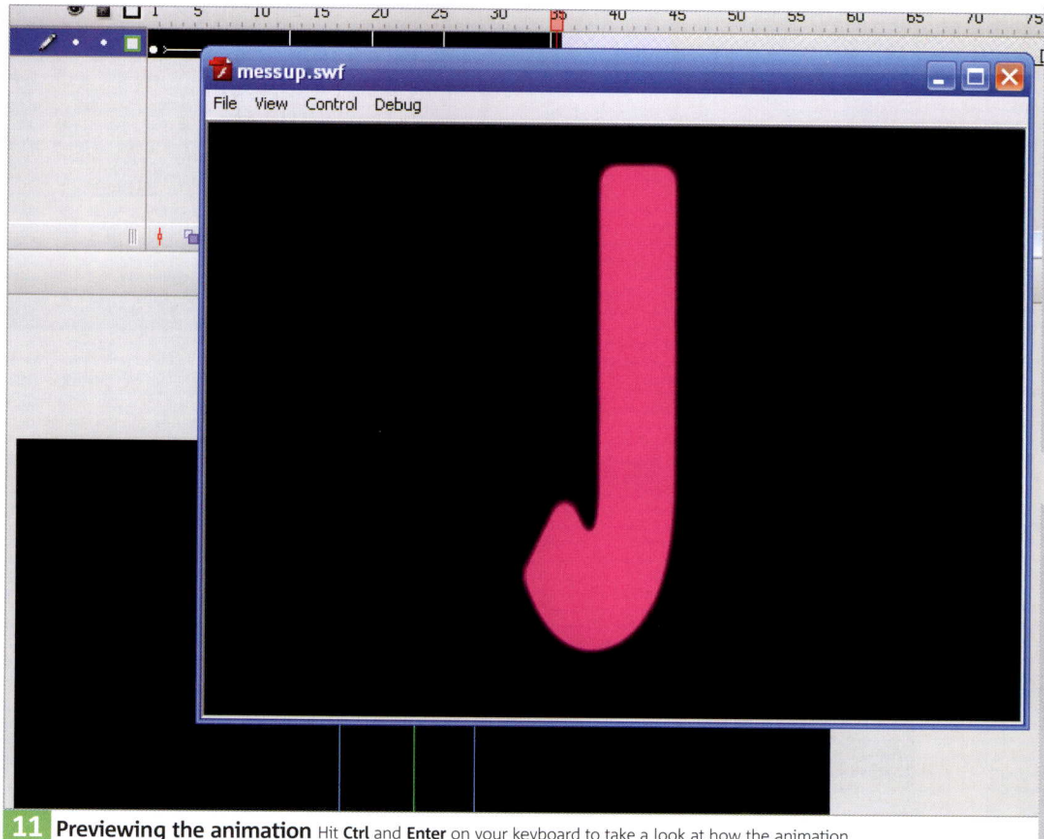
8 Holding the animation We want the animation to 'hold' for a number of frames before shrinking off to the distance. Do this by creating a keyframe at Frame 77. This holds the animation at the same place as Frame 45. Plot one more keyframe at Frame 96.



9 Fading away Select the **jsymbol** clip and click the tab to reveal the properties inspector. Change the width and height options to: **W: 17.9**, **H: 62.4**. Position the clip in the properties inspector at **X: 170** and **Y: 101**. Select the movie clip at frame 96 and change its **Alpha** setting to 0%.

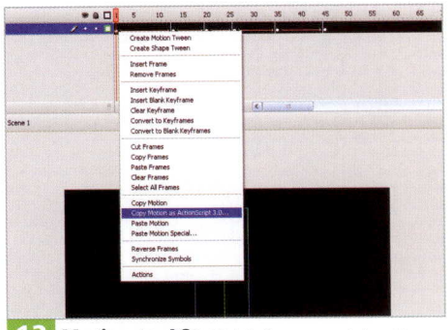


10 Tweening Click and drag from Frames 1-35. With these selected, right-click and choose **Create motion tween**. Click in frame 77, right-click and again select **Create motion tween**. These tweens will create tweened animation that will blend the fade-in, glow and tint and scale effects together.

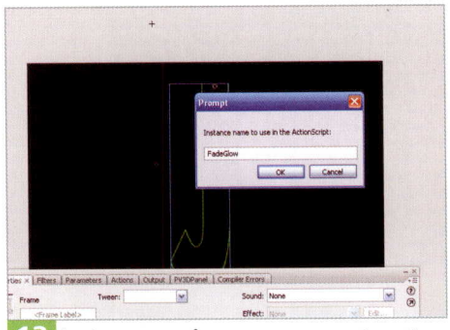


11 Previewing the animation Hit **Ctrl** and **Enter** on your keyboard to take a look at how the animation is shaping up. The **jsymbol** will fade in, glow through pink and green and then hold for a few frames before shrinking and fading out. Save your file.

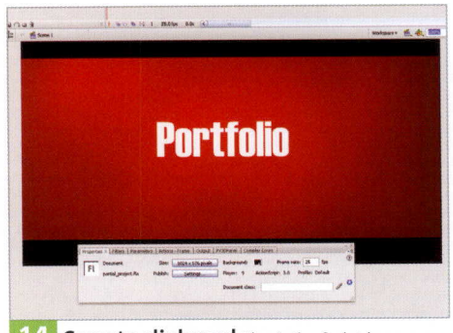
>>



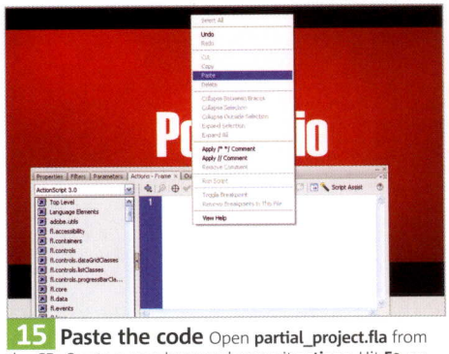
12 Motion to AS3 Click in frame 1 and drag the mouse across to the frame 96. Right-click and select from the drop-down options, **Copy Motion as Actionscript 3.0**. Alternatively, you can do this from the **Edit** menu by selecting **Edit>Timeline>Copy Motion as ActionScript 3.0**.



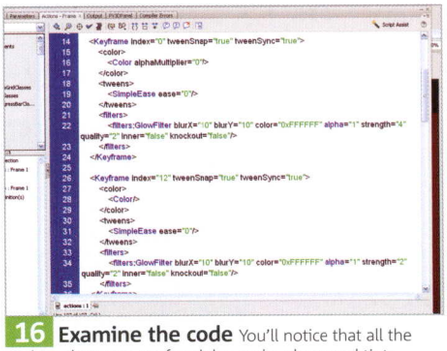
13 Instance naming A pop-up prompt box will appear, asking you to name the instance name used in the ActionScript. This is an important step, as the code generated will refer to this instance name. Enter the name **FadeGlow**.



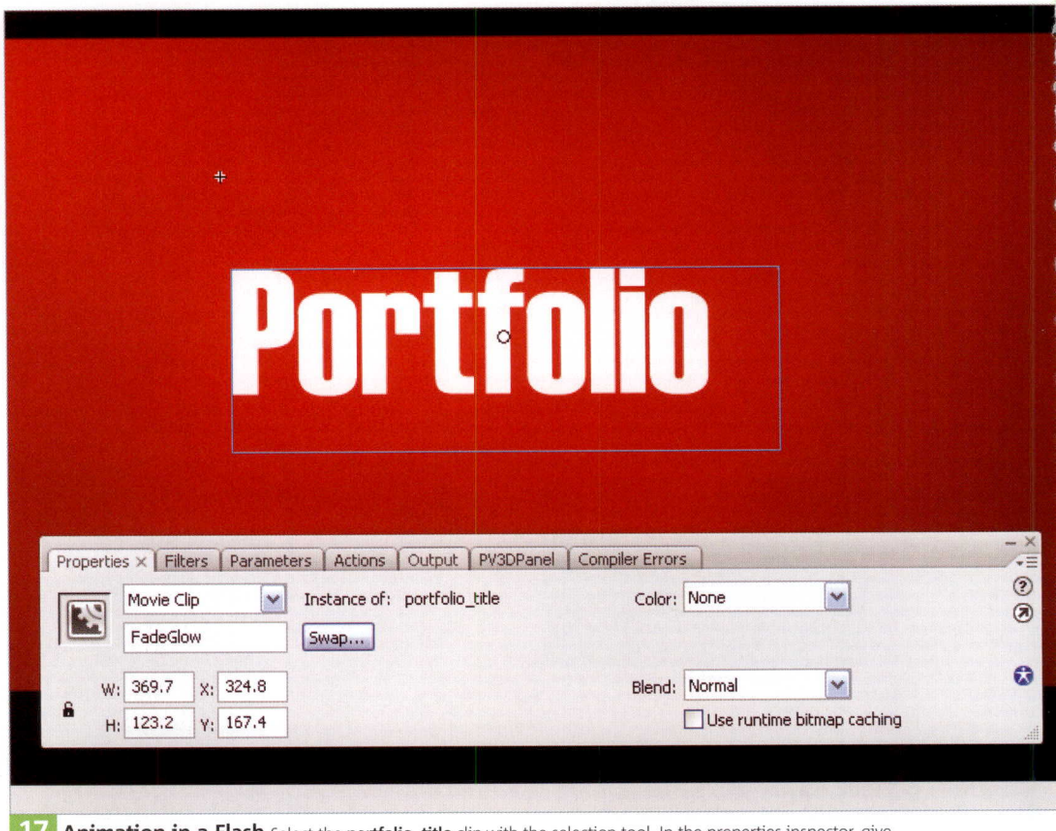
14 Copy to clipboard The ActionScript is now copied to the clipboard and is ready to be applied to a new clip. If you're compiling a library of animations, you can copy this code into Notepad, name it **FadeGlow** and reuse it at a later time. We're going to add it to a new movie.



15 Paste the code Open **partial_project.fla** from the CD. Create a new layer and name it **actions**. Hit **F9** on your keyboard to bring up the actions panel. Click within this then right-click and select **paste**. The code will appear in the actions panel.

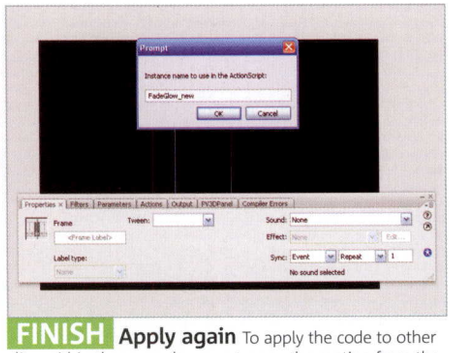


16 Examine the code You'll notice that all the options that were set for alpha, scale, glows and tints are described in an XML-style breakdown within the code. You could potentially customise these by changing the code directly.



17 Animation in a Flash Select the **portfolio_title** clip with the selection tool. In the properties inspector, give the **portfolio_title** movie clip the instance name of **FadeGlow**. Ensure you name this exactly the same way as when the instance name was given in step 13. Any changes to the name at this stage will result in the animation not working.

18 Preview the animation Hit **Ctrl** + **Enter** to preview the site animation. You'll see the **portfolio_title** movie clip act in the same manner as your earlier created animation, with the same 'blow out' and scaling effects.



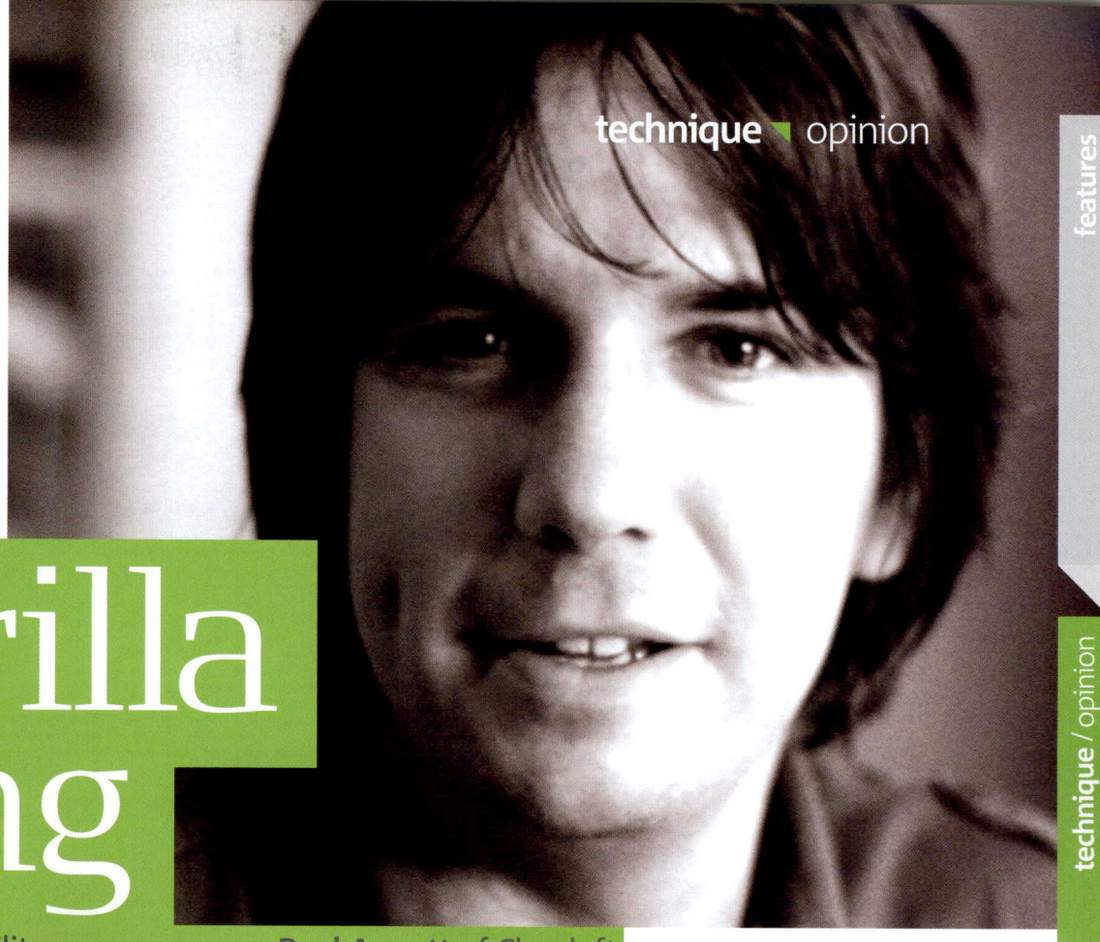
FINISH Apply again To apply the code to other clips within the same document, copy the motion from the original document again and give it another instance name. Paste it below the original code in the actions panel and give the new clip the new instance name given to the code.

Expert tip Next steps

A 'master' animation document containing many cases of copied motion can save you time and considerable effort if you're working heavily in Flash. That's because just as developers keep their own 'clippings' of oft-used code, you can do the same with animation styles.

All you have to do is copy the motions, as shown in the tutorial, and compile them by pasting them into Notepad.

Over time you can add to them to compile your own unique master document of animation styles.



Paul Annett on ...

Guerrilla testing

Testing early is the key to usability success, argues **Paul Annett** of Clearleft

Designing websites we consider to be easy to use is one thing, but checking they genuinely meet the goals and expectations of users is something that often gets overlooked. As we continue to move from a web of static pages into a web of applications with rich interaction, usability testing has never been more important.

Unfortunately, it's often neglected because it's considered time consuming and expensive. If you're working to a tight budget, it's the part of a project that seems easiest to drop, unlike design or development. With a basic understanding of the techniques, however, it's possible to conduct your own 'guerrilla' usability tests in a few hours using tools you have to hand.

At Clearleft, we like to start testing early in the process, ideally before investing time on an approach that we might later discover doesn't work. Before even considering significant design details we create an HTML wireframe (like a blueprint) for each page of a site, and use JavaScript to simulate interactions and behavioural nuances. Alternatively, if there are specific visual details that need testing, we turn the design concepts into a series of clickable image maps to simulate the completed site. At this stage, the quality of the code and delivery method can be 'quick and dirty'. It need only work in one browser: the priority here is efficiency. These wireframes form the basis for our first tests.

Before we start testing, we write some representative tasks to test the site. These are aligned to typical goals, for example: 'Check your account balance'. Our aim is to find areas for improvement, not just to 'pass' the test. This isn't a process of purely trying to validate what's already been designed, so we focus on complex interactions where we anticipate issues. Every usability test will highlight problems, so we make sure not to ask leading questions. Tasks are phrased as generically as possible, avoiding instructions like 'Search for...' or 'Click on...' If a site needs specific instructions on how to use it, there's something fundamentally wrong with the design!

Selective recruitment

For a first round of usability testing we recruit half a dozen participants, choosing people who are representative of the site's intended audience. By this stage we'd have created personas of typical users for the site, and use these to choose participants. We arrange a time and a place to meet each one individually for an hour without distractions, and reassure them that we're not testing them, we're testing the website. We always give the participant their small fee up front, so that they don't feel like they have to earn it in the test by performing a certain way.

First, we explain what the site is about and who it's aimed at. We do think-aloud testing, asking the participant to talk through their actions, noting their expectations before each one. During the usability test they may require some prompting, but we're careful to prompt neutrally. "What are you thinking?" is good; "Was that easy?" or "No, you idiot, just click the bloody 'info' tab" are not.

> "At this stage, the quality of code and delivery method can be 'quick and dirty'" Paul Annett

If an issue arises only once during testing, it may be nothing to worry about. When several participants are having similar problems, we know it needs more work. Sometimes we can try a quick fix between test sessions and see if the rest of the participants still have trouble. At other times we need to go away and rethink something on a larger scale, before retesting the site with a different set of participants.

Recording the tests is essential. In the past, we filmed the screen activity and the participant's face with separate camcorders, and took notes of any problems. Though it was cumbersome and arduous to review, the results were important, so we developed Silverback, a Mac application to streamline the process and dispense with the need for extra hardware (download it from www.silverbackapp.com).

Testing on real users often gives surprising results, and the improvements that can be made as a result of this insight easily justify spending a little time on a bit of home-brewed testing. On a web where hundreds of sites compete for the same audience, the easiest to use will almost invariably win out. Reducing complexity at each stage is the key to success, and guerrilla usability testing should be the weapon of mass reduction in the arsenal of every freelancer or small agency. ●

Paul Annett is design lead at Clearleft (www.clearleft.com) and blogs at www.paulannett.co.uk.

/Flash/optimise your Flash movies

Widen your website's appeal by delivering its content more quickly. **Paul Wyatt** explains how to streamline your visuals without compromising on quality

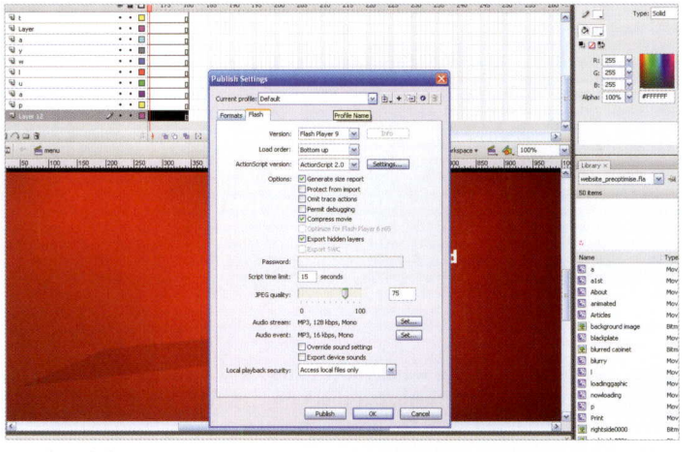
Your essential CD
All the code from the tutorial can be found on the CD.

Knowledge needed Flash CS3
Requires Flash CS3
Project time 1 hour

In this miraculous 21st century with super-duper whizz-bang broadband connections, it may seem rather silly to worry about optimising Flash movies. But by not doing it you risk losing visitors to your site. There are some amazingly bloated Flash websites out there that stutter and start as they load, even on the fastest connections. The worst offenders are often film sites, and it seems common for developers to put huge, unoptimised images in Flash files, slap on a preloader and think they're done. It goes without saying that by doing this they aren't enhancing the user experience. If you optimise that Flash movie then the preloader won't drag for so long, the movie will load quicker and your visitors will discover your content sooner.

Consider those visitors to your site who may be perfectly happy with their 56k dial-up modem. It's a mistake to believe that everyone is as tech-savvy as you are. Many people have older equipment and much slower connections. Widen the appeal of your message by optimising your site as much as you can. Even 20kb trimmed from a movie is 20kb of Flash fat, which, when removed, delivers your site that bit quicker to your audience.

There are a number of ways to make your site lean and mean. We'll look at these tips and tricks, which you'll be able to apply to your own website or Flash banner creative. For those of you who have to produce the dreaded 35kb ad banners, and have clients who want everything but the kitchen sink in them, this tutorial will be hugely beneficial. Also on hand we have Matt Loomis, co-founder of Loomis & Jones Creative, to give us practical advice about planning website creative – including both the key considerations and some practical know-how.



On the slide Drag the slider to decrease the compression percentage for your JPEG. The lower it gets, the more colour information you'll take from the image

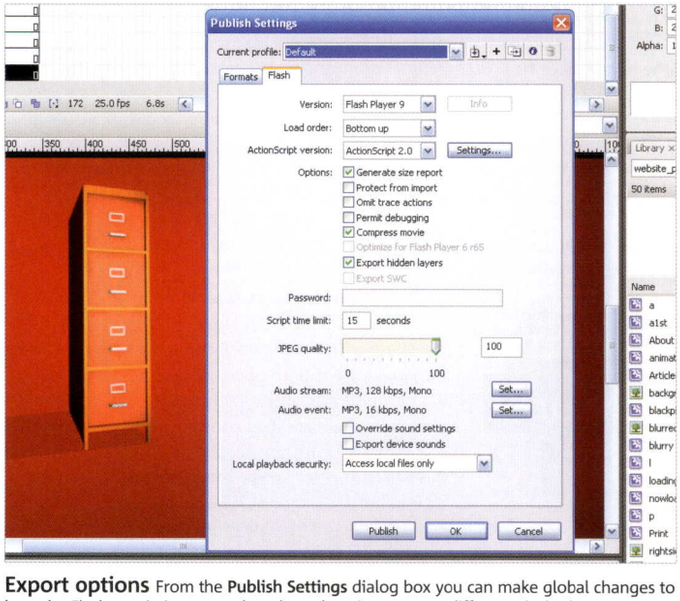
The sample project is from the Paul Wyatt Portfolio website. This example uses 3D images exported from Cinema 4D as a PNG sequence. We'll look at the best way to optimise these once they've been imported into Flash. We'll also look at how Flash sound can be tweaked, the perils of embedding fonts, external file loading and optimal publish settings.

Define publish settings

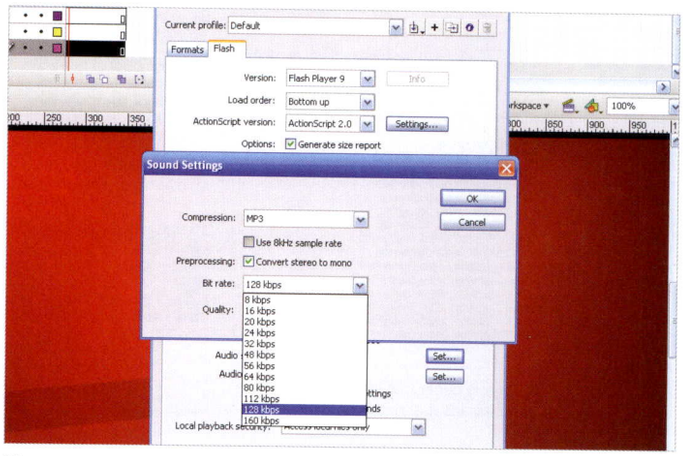
There are times when you'll be given a Flash document that's been produced elsewhere and it'll be your job to make some amends and publish it with optimal compression settings. Open **website_preoptimise.fla** from the disc. An SWF produced from this file without adjusting any compression settings would result in a file of 262kb.

Select **File > Publish Settings** to bring up the **Publish Settings** pop-up box. From here, you can make changes to how the Flash movie is exported, and what levels are applied to the movie elements and sound contained within your exported SWF file. The options selected here are global. The amount of compression you set for sound and JPEG quality will be applied to all the sound elements and images within the file.

In the **Publish Settings** dialog box, select the **Flash** tab. The first option here is to select the Flash version to be exported to. If your movie is making use of Flash filter effects or advanced stroke options, make sure you're publishing to the Flash Player version that supports these options – in this case, Flash Player 8 and above. You may notice that your Flash movies will be a few kb lighter when exported at a higher Flash Player version. Export the same movie at a lower Flash version and it will, most likely, add a few kb. If you're creating online banner campaigns you could find, to your peril, that most companies serving these ads may want them outputted at a lower Flash



Export options From the **Publish Settings** dialog box you can make global changes to how the Flash movie is exported, such as choosing to use a different Flash Player version



Listen up Use the **Sound Settings** dialog to change your audio according to its destination. The higher the **Bit Rate** value, the better the sound quality on export

Player version than the one you've used. This could push you over the 35kb limit on your banner by reversioning it. Always check the output Flash Player first before starting your creative work – it'll save your sanity later on. For our file we've selected Flash Player 9.

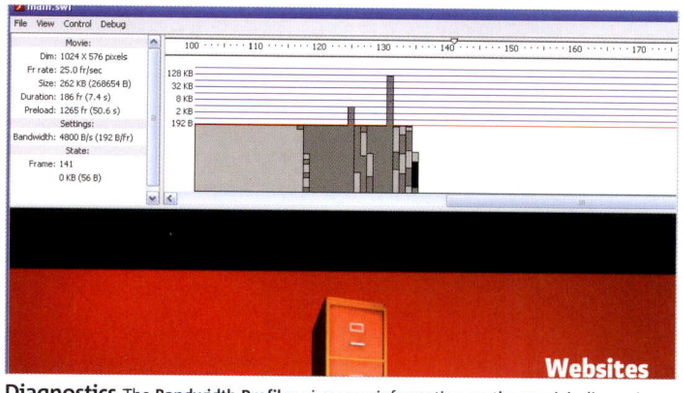
In the **Options** section of the **Publish Settings** dialog, check the box to generate a size report for the movie. What this does is create a frame-by-frame report of the size of the movie. This will show you how many shape bytes each symbol contains, as well as information on how much file size is taken up by any embedded fonts. Be sure to check the box for **Compress Movie**. JPEG quality is set by using the slider to increase or decrease the amount of compression used on images within the movie. The more you decrease the compression percentage – as indicated in the box to the far right of the

The preloader won't drag for so long and your visitors will discover your content sooner

slider – the more colour information you'll be taking from the image. We've dragged the slider to the 75 per cent compression setting.

Alter your audio

Finally, we have the global compression settings for sound files. Click the **Set** button next to the **Audio Stream** button to select options for the sound compression, bit rate and quality. A streaming sound will play as soon as there's enough sound data downloaded for it to begin. Event sounds don't play until they completely download first. A drop-down box gives you a



Diagnostics The **Bandwidth Profiler** gives you information on the movie's dimensions, file size and duration, and shows you any areas that might cause download problems

Q&A Graphics-based websites

Name Matt Loomis
Job Co-founder of Loomis & Jones Creative
Areas of expertise Graphics, branding, design
About Matt As well as co-founding Loomis & Jones Creative, Matt's colourful past includes on- and offline branding, illustration, interactive design and creative solutions for clients ranging from record labels to large pharmaceutical companies
URL www.loomisandjones.com and www.creativeloom.com

net: How do you go about putting together graphics for a website and what are the chief considerations?
ML: The clients' needs and purpose of the website are paramount. This then influences the graphics, functionality and type of website that's best suited. I think it's important to consider how it's going to be built and how the graphic elements will work within the site structure.

Graphics-wise, I'm not shy at flooding the brain space with existing creative examples, styles and ideas from all mediums, and checking my clients' main competitors' websites to get the edge over the crowd. A dope background image can really bring a website to life, either as the main creative element or to subtly pull the content out. If it's a 'busy' site, I try not to have everything screaming for attention on the page, instead using the graphics to give the user a subconscious focus point or path.

net: What tools do you use to produce web creative?
ML: I'm primarily a Photoshop/Illustrator/Flash man on a PC. I do love Photoshop's Adjustment Layers and the recent Smart Object functionality, which allows History on applied filters. The ability to import layered PSD files into Flash is also a winner.

net: What's your advice for making graphic-rich, user-friendly websites?
ML: With the advent of fibre-optical-tastic broadband, it's become easier to create hybrid sites that can use both graphically rich motion graphics (through FLV/SWFs) and HTML body text, encased within a CSS structure. This keeps it user-friendly, future-proof (of sorts) and better listed in search engine results, and can offer the user a visually enhanced experience, with the main information still visible when the styles are switched off. Personally, I also think that while it's cool to experiment with new styles and ideas for navigation, I find leaving it simple allows me to go to town more on the other graphical elements, without detracting too much from the core user functionality.

number of options to assist in compressing the sound. The first is **Disable**, which will turn off all the compression options and export the file without any sound at all. **ADPCM** is a very slight form of compression. For the web it's not the best, and you should be using the **MP3** option for your work. Using this will result in small file-size audio files with exceptional compression. If your work is destined for enhanced CD or Kiosk output, select **RAW**, as this will apply no compression at all. **Speech** delivers optimised, clear sound files for voice-only recordings. There's also a check box to convert stereo to mono.

For our example, we'll select **MP3** as the compressor and in the **Bit Rate** drop-down we'll select **16Kbps**. The higher the value here, the better quality the sound will be on export. Our sounds are short-burst sound effect samples, so we can go quite low with the export settings. For longer tracks, use a higher bit rate. What you can't do within Flash is import audio files and export them at better quality than the original files. Don't expect Flash to remaster your files! So, if your imported file has a bit rate of 80Kbps and you exported it as 160Kbps, it won't suddenly increase the original's quality. What you will get is a very peculiar sounding music file – one that may suffer from 'clicking', an audible click due to the mismatched export options.

One more audio optimisation in the **Publish Settings** box is **Override Sound Settings**. This check box will apply what you've just selected to all the audio files in your Flash document. It will override individual file settings.

Now you can begin to optimise individual elements. In the **Formats** tab of the **Publish Settings** pop-up box, check the box next to Flash. >>

Flash optimisation tips

More ways to speed up your site

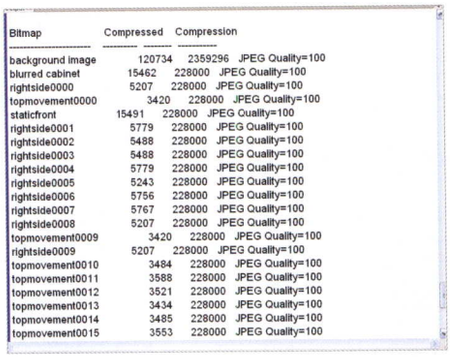
Vector symbols can be optimised by selecting the graphic symbol from the library. Double-click to enter its editing mode. Select **Modify > Shape > Optimise**. A dialog box will pop up, which you can use to optimise the curves of the image. The fewer curves a vector image has, the less memory it will take up when Flash draws out the image. This helps to cut down on bandwidth spikes when these elements are encountered as they download. Push the slider forward to remove some curves. Click **OK**. A pop-up box will let you know how many curves have been removed. This is a game of trial and error, as taking out too many curves will change the appearance of the image substantially. Experiment to find the optimal setting for your vector symbol.

Need to cut a few kb off a Flash banner? Try opening up individual movie clips and removing redundant frames. Say the animation in the movie clip plays for 100 frames but the timeline carries on for another 150 – remove these redundant frames to save on file size.

To make sure you don't end up with unused Flash objects, images or symbols embedded into your SWF on export: be sure to clear the Flash library of unused items. Select the down arrow on the far right of the library and pick **Select Unused Items**. Once these are highlighted, hit the rubbish bin icon to remove them.

If you're using embedded fonts, embed only the glyphs you need. Most fonts contain thousands of glyphs, which all add up to bigger SWF files.

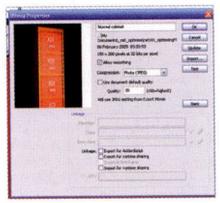
And finally, be clever with your designs by duplicating movie clip and graphic symbols. Once registered in Flash memory, these symbols won't add to the Flash file size if they're used repeatedly.



```
Bitmap                  Compressed   Compression
----------------------  ----------   -----------
background image            120734    2359296  JPEG Quality=100
blurred cabinet              15462     228000  JPEG Quality=100
rightside0000                 5207     228000  JPEG Quality=100
topmovement0000               3420     228000  JPEG Quality=100
staticfront                  15491     228000  JPEG Quality=100
rightside0001                 5779     228000  JPEG Quality=100
rightside0002                 5488     228000  JPEG Quality=100
rightside0003                 5488     228000  JPEG Quality=100
rightside0004                 5779     228000  JPEG Quality=100
rightside0005                 5243     228000  JPEG Quality=100
rightside0006                 5756     228000  JPEG Quality=100
rightside0007                 5767     228000  JPEG Quality=100
rightside0008                 5207     228000  JPEG Quality=100
topmovement0009               3420     228000  JPEG Quality=100
rightside0009                 5207     228000  JPEG Quality=100
topmovement0010               3484     228000  JPEG Quality=100
topmovement0011               3588     228000  JPEG Quality=100
topmovement0012               3521     228000  JPEG Quality=100
topmovement0013               3434     228000  JPEG Quality=100
topmovement0014               3485     228000  JPEG Quality=100
topmovement0015               3553     228000  JPEG Quality=100
```

Above The file size report generated from Flash can help reveal movie clips and bitmaps that need trimming

Below Due to its lack of visibility in the movie and how suddenly it appears, you can apply a heavier amount of compression to this element. Highly visible content, such as the background image, won't take as much compression



>> Use the folder icon to browse to your working folder and select this as the output for the Flash file. Instead of hitting the **Publish** button, hit **OK** instead. The compression settings you've just chosen will take effect when you preview the file from within Flash. You'll also use the bandwidth profile to check its size. This is a lot simpler than publishing the movie, locating the file and right-clicking it to find out its size each time.

Before previewing, select **Window > Output** to bring up the output window. This will contain the size report you selected in **Publish Settings**.

Hit **Ctrl** and **Enter** to preview the movie. Then, from the **View** menu of the SWF itself, select the **Bandwidth Profiler**. This gives you information on the movie's dimensions, file size and duration. It also enables you to emulate a number of download settings. To the right of the movie, settings and state headings at the top of the profiler there's a frame-by-frame guide to the data downloading into each frame. The red line running across this is the bandwidth limit. Anything under this line will be shown quite quickly. Any bars that stretch above this and cause 'spikes' can cause download problems. You should remember that optimising a Flash movie isn't just about reducing its file size – it's also about streamlining the demand on memory needed to redraw images. It's quite likely you'll have a sudden spike when a number of elements are loaded into a scene at the same time – usually at the start of a movie. Any spikes beyond this may be due to large graphic files or highly detailed vector drawings.

Streamline memory demand

Each spike can be clicked on to move to the frame in the movie that contains the offending elements. You can test your work by selecting **Simulate Download** from the **View** mode and then choosing a modem speed from the **Download Settings**. Let's look at the information given in the output window to give you some idea of what you can optimise to reduce this. The background image is highly visible, so less compression can be applied to this element. To compensate for this, greater compression is added to less noticeable elements.

In the Flash library, select the PNG image **blurred cabinet**. This is the image of the filing cabinet, which is seen very quickly as it drops into the website. Due to its lack of visibility in the movie and how suddenly it appears, you can apply a heavier amount of compression to this element. Right-click on the library element and from the available selections choose **Properties**. This will bring up the bitmap properties. Your first check-box option is **Allow Smoothing**. Leave this selected, as it keeps the image really smooth if you're rotating, squashing or rescaling it. By default, the image is taking the global compression settings you selected in the **Publish Settings** dialog box. Uncheck **Use Document Default Quality** to reveal a number of optimisation options for the image. Change the quality setting to **35** by entering this in the **Quality Input** box. Now hit **Test**.

The preview image on the far left of the dialog box shows the image with the new optimisation settings applied. Underneath the JPEG settings, Flash gives you a breakdown of what the original file size was and how much has been shaved off when compression has been applied. Experimentation with a number of settings is the name of the game when it comes to further optimising the graphic elements of your SWF movie.

By using the file size report generated from Flash and looking at spikes in the **Bandwidth Profiler**, you'll find it easy to identify which elements of your Flash movie are fat and which need to be trimmed. Applying the techniques above reduced the file to around 60kb.

Remember that optimising a Flash movie isn't just about reducing its file size

Our project example involved a mix of elements created in several programs – vector text in Flash, animations in Cinema 4D rendered out as PNG frames and backgrounds created in Photoshop. If, however, most of your design is to be produced in Photoshop CS3, you can take advantage of the new PSD importer feature.

This great function arrived with Flash CS3 and enables you to take a Photoshop document and bring it directly into Flash. The Photoshop layer structure is replicated in Flash and the individual graphic elements can be converted via the PSD importer into graphic symbols. On import you're also given optimisation controls over each individual layer of the PSD file. This gives you a great deal of choice as to how each layer will be optimised.

However, you won't be able to see what the graphic elements look like with the compression applied until you preview the movie – but you can also fine-tune these settings using the techniques we've explored in our project. Episode one of .net's WDTV podcast has a complete video tutorial for using this feature. You can download this and many other tutorials at www.netmag.co.uk/zine/podcast. ●

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Name Paul Wyatt
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Areas of expertise Interactive web design, motion graphics
Clients *The X Factor*, Fanta, Smirnoff and Research Studios
What do you do to relax? Hmm, I guess cycle, swim and keep away from people

Catherine Ward-Brown on ...

Beating the credit crunch

Web design agencies can thrive in a recession if they employ the right strategy, says Fortune Cookie's **Catherine Ward-Brown**

If you've been a professional web developer for eight years or more, you may have painful memories of when the dotcom bubble burst. Clients stopped spending, some web agencies went under and many web developers lost their jobs. With everyone talking about the credit crunch, is more pain inevitable?

Not necessarily. Clients will tighten their belts during a recession, but that doesn't mean they'll stop online spending altogether. So how can web design agencies thrive at a time when clients are trying to economise?

The credit crunch may be mid-bite, but I predict solid, continued growth for web agencies because online can actually be a more cost effective (and profitable) way to run a business during times of economic uncertainty. The downturn is forcing clients to evaluate their investments more closely, but this doesn't mean they'll stop spending on online channels. Clients will simply spend smarter – some will actually spend more.

Web projects can reduce business costs and management overheads because the web is a very cost effective channel for sales, marketing and customer service. Web agencies should encourage clients to invest in more efficient ways of working and exploit the web's many advantages over costly bricks and mortar and call centres.

To give you an example, National Rail Enquiries (www.nationalrail.co.uk) is the most telephoned number in Britain, with 140 million customer contacts per year. Each contact dealt with via a call centre costs NRE £0.50. In order to save money – and for travellers' convenience – the company wanted to drive more enquirers online. NRE developed a virtual agent, Ask LISA, to handle timetable and other rail travel enquires via its website. Ask LISA now handles 300,000 enquiries per month with 90 per cent accuracy (higher than NRE's offshore call centres) and enquiries handled this way cost just £0.03 per customer contact.

Smart businesses will power through the credit crunch by investing in larger and more strategic web projects such as these. Smart web agencies will survive by repositioning themselves as strategic partners to their clients.

Project management is coming under increasing scrutiny from clients, so invest in a business process that's ISO 9001:2000 certified. This will reassure your clients that you use a clear, repeatable process designed to mitigate risk and deliver results on time and budget. Present your client with clear, detailed proposals that describe in detail the scope, deliverables and processes that will be applied to the project. Being transparent about your planning process will ensure a successful project and boost your client's confidence in you.

> "Web agencies should encourage clients to invest in efficient ways of working" Catherine Ward-Brown

There is now keen competitive pressure on clients to exceed consumers' expectations. In this climate, clients are looking for 'value-based relationships' and are comparing prices more closely than before. If web design is all you offer, consider partnering with other agencies so you can offer clients strategies for multiple routes to market (web, mobile, outdoor). Partners such as affiliate networks, customer acquisition specialists, content aggregators and price comparison services can greatly enhance your offering and make you much more appealing to a cost-conscious client. For example, Fortune Cookie has formed a strategic partnership with EPiServer to provide content management systems for our clients. We have already done the difficult bit in identifying the best system for the job, so that's one less thing for them to worry about. Think how much more appealing your prospective client will find you if you can provide them with everything they're hoping for.

Nurturing existing client accounts is the key to success, especially during a recession. Competitive pitching has become extremely expensive so, once you've landed a prime account, do all you can to nurture the relationship. Client accounts should be seen as a long-term investment. By helping your clients shape their digital strategy, you can ensure they're on the right path to delivering long-term, sustainable value to their business with you as their partner. Clients who make informed decisions about where and when to invest during the credit crunch are more likely to make it through this challenging period. Position your agency as a strategic partner, nurture client relationships and you'll thrive in these uncertain times. ●

Catherine Ward-Brown is director of new business at Fortune Cookie (www.fortunecookie.co.uk), whose clients include the Lawn Tennis Association, Oxfam International, Kuoni and Legal & General.

/Flash/optimise video delivery with Flex

Your essential CD
All the code from this tutorial can be found on the CD.

Jam3Media's **Mark McQuillan** explains the benefits of coding in Flex and how to tailor a user's video experience to their bandwidth speed

Knowledge needed ActionScript 3
Requires Flex Builder
Project time 2 hrs

To say that internet users are impatient is an understatement. People want their content and they want it fast. Why not give them what suits them by doing a little bandwidth profiling and load which video is most optimal for their experience? This is a simple and cost effective alternative to streaming videos via the Flash Media Server and enables you to cater to both your low and high bandwidth users by having several videos in varying sizes and bitrates.

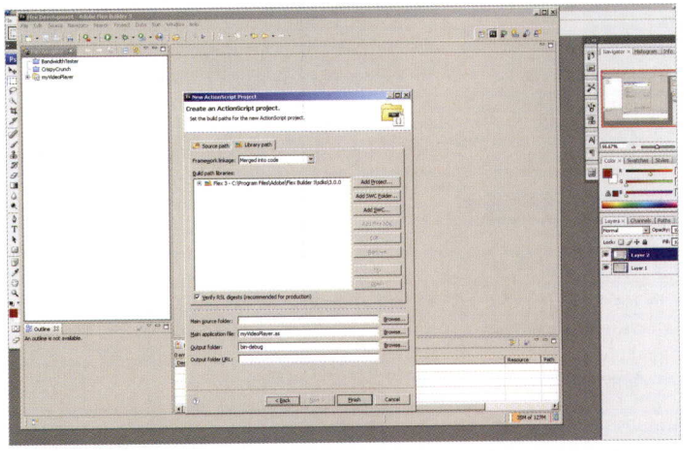
If you haven't already, download Flex from adobe.com/products/flex. Follow the steps to install the program then run **Program Files > Adobe > Adobe Flex Builder 3**. Go to **File > New** and select **ActionScript Project**. You'll get a prompt to enter a program name; enter **MyVideoPlayer**, then click **Next**. Now select **Library**, click **Add SWC...** and navigate to **C:\Program Files\Adobe\Adobe Flash CS3\en\Configuration\Components\Video**, where you need to choose the **FLVPlaybackAS3.swc** file. This is Flash's built-in FLVPlayback component, which we want to use for our application. (Alternatively you could build your own FLV player and use that.)

Click the **Finish** button and Flex will set up the project and write the package. Look: we haven't typed a single keystroke in the editor and we already have nine lines of well-formatted code.

```
package {
        import flash.display.Sprite;

        public class myVideoPlayer extends Sprite {
                public function myVideoPlayer() {

                }
        }
}
```



Getting started Download and install Flex, select **ActionScript project** and give your project a name, click **Next**, select the **Library** tab and click the **Add SWC...** button

Next go to **File > New > ActionScript Class** and a dialog window will appear. Type **com.jam3media.utils** in the **Package** field. Then in the **Name** field put **BandwidthProfiler**. Leave the modifiers set as public. We want our class to extend Sprite, so in the Superclass field type in **Sprite**. Click **Finish** and Flex will create the class for you and open it.

```
package com.jam3media.utils
{
        import flash.display.Sprite;

        public class BandwidthProfiler extends Sprite {
                public functionBandwidthProfiler() {

                }
        }
}
```

Amazing stuff, this Flex: another 11 lines of code and our mouse has done most of the work. Flex now has your two documents open and you need to go back to the first one, **MyVideoPlayer.as**. Now for some typing. In the constructor, begin by declaring a new variable called **bandwidthProfiler**, whose data type will be **BandwidthProfiler**. But pay attention – as you type, see how Flex reacts to your keystroke when you add the colon. A Code Assist drop-down will appear with every class available.

Because we created the **BandwidthProfiler** class in the previous step, Flex has added this to its list of available classes. Flex 1, Flash 0. Choose the **BandwidthProfiler** in the drop box and Flex will do two things: write the class of the variable and include the import statement in our package. Doing this now will ensure Flex will highlight any errors you might have in the **BandwidthProfiler** class.

Let's publish our project just for fun. Your default browser will run and you'll see a whole lot of nothing on a blue background. I don't know about you, but I like my Flash applications to run in Flash player: that makes it easier to work with, as it will launch faster. So let's go into **Project > Properties**. On the dialog box that opens, on the left, click **ActionScript Compiler** and uncheck **Generate HTML wrapper file**. Click **OK**. Now if you launch the project by pressing **F11** you'll see that it runs using a FlashPlayer that gets installed with Flex. When your application is completed, you may want to turn this back on because you'll eventually want the HTML to embed this SWF.

Expert tip Shortcut

Use Ctrl + spacebar to manually enable 'content assist' (see livedocs.adobe.com/flex/3/html/help.html?content=codeeditor_3.html). Remember that this works at the end of a line and not at the beginning.

Using a constant is a good habit as it will help you avoid using 'magic numbers'

Back in our bandwidth profiler class we have to accomplish a few things. We'll download a file and time how long it took do so. When we're done, we're going to dispatch a complete event. In the class scope we're going to set up some properties to complete the task. We'll want to know the time the download begins. We'll want to store the bandwidth detected and if something goes wrong, we'll call upon our constant to bring up the rear in the case of some kind of error. Using a constant is a good habit because it will help you avoid using 'magic numbers' inside your code.

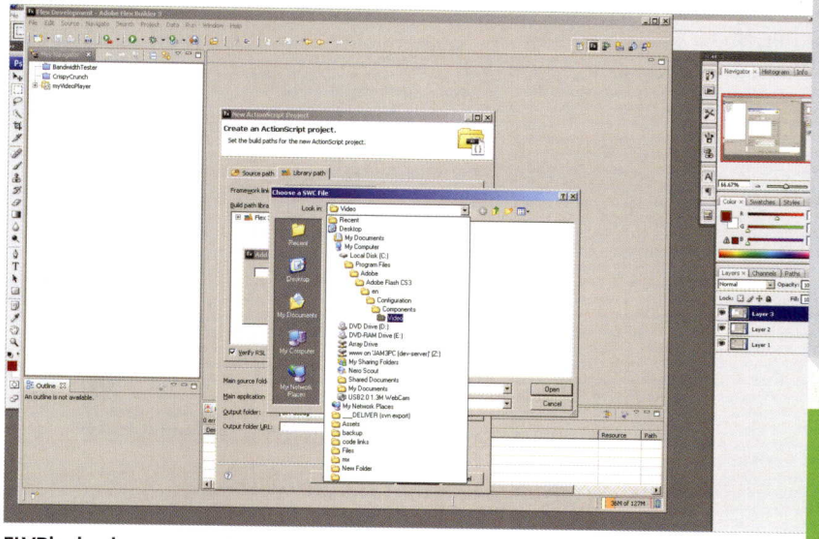
```
private var _startTime:uint
private var _bandwidthDetected:Number
private const DEFAULT_BANDWIDTH:Number = 500
```

In the constructor, set the **bandwidthDetected** to your constant as a default. Then create the function that actually detects the bandwidth, **checkBandwidth**. In AS3 load content using the **Loader** class and the **URLRequest** class – be sure to utilise Flex's auto-complete functionality so the import statements automatically appear at the top of the class. As you know, browsers cache content and we want our profiling to happen every time a user accesses our content. In order to get an uncached file request you need to tack on a cache-blocking string to the end of the URL so that you can get live results each time you call the checkBandwidth function. Then download the file **bandwidth.jpg**.

```
public function get bandwidth():Number{
        return _bandwidthDetected
}
private function startHandler(e:Event):void{
        _startTime = getTimer();
}
private function getCacheBlocker():String {
if ((Capabilities.playerType == "External" || Capabilities.playerType == "StandAlone")) {
                return "";
        } else {
                return "?ck="+(new Date()).getTime().toString();
        }
}
```

Before you ask your loader to load the request, you need to set up your event listeners to catch the start of the loading (to save the start time), and the finish. Once you have both points of reference you can calculate the kbps. But if your file fails to load for some reason you need to have your application serve up the default bandwidth selection. For the sake of this tutorial, we're funneling all of the error events into one callback. You may want to capture errors differently depending on your needs.

```
public function checkBandwidth():void{
var loader:Loader = new Loader();
var request:URLRequest = new URLRequest("bandwidth.jpg"+getCacheBlocker());
loader.contentLoaderInfo.addEventListener(Event.OPEN, startHandler);
    loader.contentLoaderInfo.addEventListener(Event.COMPLETE, completeHandler);
loader.contentLoaderInfo.addEventListener(IOErrorEvent.IO_ERROR, ioErrorHandler);
  loader.contentLoaderInfo.addEventListener(IOErrorEvent.NETWORK_
ERROR, ioErrorHandler);
loader.contentLoaderInfo.addEventListener(IOErrorEvent.DISK_ERROR, ioErrorHandler);
loader.contentLoaderInfo.addEventListener(IOErrorEvent.VERIFY_ERROR, ioErrorHandler);
loader.contentLoaderInfo.addEventListener(SecurityErrorEvent.SECURITY_
ERROR, ioErrorHandler);
loader.load(request);
}
...
private function completeHandler(e:Event):void{
```



FLVPlayback To use Flash's built-in FLVPlayback component, navigate to **C:\Program Files\Adobe\Adobe Flash CS3\en\Configuration\Components\Video**

```
var time:Number = (getTimer() - _startTime) / 1000;
_bandwidthDetected = Math.round((e.target.bytesTotal / 1000 * 8) / time);
            dispatchCompleteEvent();
}
private function dispatchCompleteEvent():void{
dispatchEvent(new Event(Event.COMPLETE))
}
private function ioErrorHandler(e:ErrorEvent): void {
                        _bandwidthDetected = DEFAULT_BANDWIDTH
                        dispatchCompleteEvent()
}
```

>>

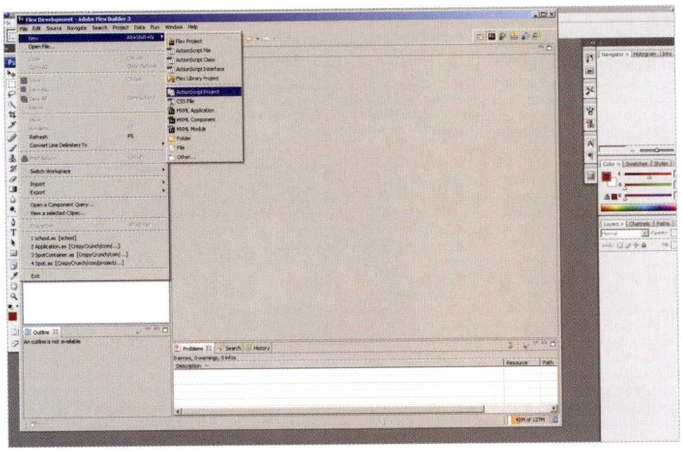
High-def Flash video

The Flash 9 player brings HD to the masses

As the average bandwidth speed is quickly increasing and with most ISPs' high and ultra bandwidth packages heading north of 10Mbps, the time for HD is on the verge of becoming the norm. No longer will you have to deal with your client questioning why the video they provided you with now looks blocky, pixellated and the size of a thumbnail. If your client is willing to fork some good dough for a nice and fast hosting package, you'll be able to take their high quality Quicktime or DVD and allow your 'hyper' bandwidth users to view it in all its glory.

This was all made possible when Adobe released an update to the Flash 9 player in autumn 2007. The new version allowed for the streaming of a couple of new video formats, those being mp4 and mov. So why and how does this make a difference? Well for starters this update included support for the H.264 video codec, which is the industry standard for various formats like iTunes, mobile phones and you guessed it, high definition DVDs. Instead of re-encoding the video in the Flash Video Encoder you can now export right out of Quicktime, selecting the H.264 codec, and serve up large, crisp, beautiful videos right in your Flash file. The added bonus is that you don't even have to change anything in your code except the file extension – just swap .flv with .mov and you're set.

The only caveat is that HD video encoded for 720p/1080p can only be properly viewed by those with newer computers. Adobe's recommended hardware specifications are for Core Duo processors or at the very least a minimum of a 3GHz Pentium. Check Adobe's HD Video page for requirements at www.adobe.com/products/hdvideo/systemreqs.html. In the meantime, we can profile our users and serve them something they can view quickly and with optimal performance.

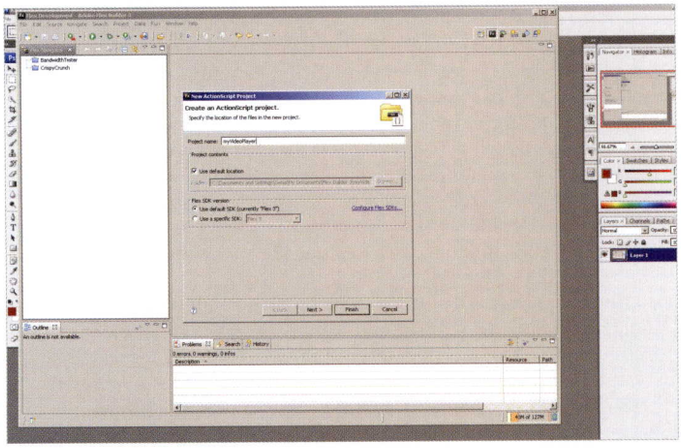


New project Once you've downloaded and installed Flex, make sure you select **ActionScript Project**, because a Flex Project is an MXML application

The last bit of magic is the completeHandler itself. Subtract the start time from the current time (both in milliseconds) to get the total time taken for the download. Finally, access the bytesTotal of the Loader then multiply it by eight (to get bits) and divide by the total time to get our bandwidthDetected value (in kbps).

With the number saved in your **class** property, dispatch the complete event. Back in the **myVideoPlayer** file, in our constructor, add an EventListener to the bandwidthProfiler for the COMPLETE event and have the event call **onComplete**. Next add the private function for the event, and capture the detectedBandwidth as it will be captured by your class. This will be a Number calculated and written in the bandwidth property of the class.

```
public function myVideoPlayer() {
        var bandwidthProfiler:BandwidthProfiler = new BandwidthProfiler;
        bandwidthProfiler.addEventListener(Event.COMPLETE, onComplete)
        bandwidthProfiler.checkBandwidth()
}
private function onComplete(e:Event) :void {
        var detectedBandwidth:Number = e.currentTarget.bandwidth
        trace(detectedBandwidth)
        var videoFile:String=selectVideo(detectedBandwidth)
}
private function selectVideo(bandwidth:Number):String{
        var bandwidthArr:Array = [300,700,2000]
        var currentBandwidth:Number = bandwidthArr[0]
        for (var i:int=0;i<bandwidthArr.length;i++){
                if (bandwidth > bandwidthArr[i]){
                        currentBandwidth = bandwidthArr[i];
                }
```



Project name Save your project name as **MyVideoPlayer**. We're then clicking **Next** to go with the default settings, but there are other options if you want to save it elsewhere

Expert tip **Size matters.**

When detecting bandwidth, a bigger file size will give you a better picture of your actual download speed. Small files may take advantage of an initial burst in downloading throughout your ISP and could skew your results. Too large a file, and your users will be waiting unnecessarily (if you plan to do this test and serve content based on the profiling immediately).

```
        }
        return "video/"+currentBandwidth+"kbps-video.flv"
}
```

If you run this you'll get a number traced out: this is our kbps, albeit running locally. We'll create a function that decides what video to play based on this number. This function will be called **selectVideo** and we'll pass the detected bandwidth to it. On the CD we've provided three videos encoded with different kbps: 400kbps, 700kbps, and 2,000kbps. The **selectVideo** function compares your detected bandwidth to your valid video sizes and returns the filepath you send to your **FLVPlayback** component. This technique is a neat and tidy way of scaling your video quality offering as much as you wish and also a way of honouring your file-naming convention for visual parsing in the folder.

Next, now that you have the String path to your video file, all you need to do is utilise the FLVPlayback component to play your video. Following the **selectVideo** method call, create a reference to the component and name it **flvPlayer** and add an EventListener to handle the receiving of the metadata.

```
var flvPlayer:FLVPlayback = new FLVPlayback;
        flvPlayer.addEventListener(MetadataEvent.METADATA_RECEIVED,
onMetadataReceived);
        flvPlayer.skin = "SkinUnderPlaySeekMute.swf";
        flvPlayer.skinBackgroundColor = 0x666666;
        flvPlayer.bufferTime = 1
        flvPlayer.source = videoFile;
        addChild(flvPlayer);
```

The metadata tells us a lot of information about the file you're going to play. In this case, we're most interested in the pixel dimensions of the video so that we may resize our component appropriately.

```
private function onMetadataReceived(e:Object):void{
e.target.width=e.info.width;
        e.target.height=e.info.height;
}
```

After you've added the EventListener, set the Component's skin proper to **SkinUnderPlaySeekMute.swf**. You can also set some other useful properties, such as background colour of the skin, the bufferTime and of course, your source: **videoFile**. Lastly, add the component to the stage by calling **addChild** and passing the **flvPlayer** reference. You now have a fully functioning bandwidth-profiled video player. Should you wish to change the background colour or the SWF frame rate you can do so by adding the SWF meta data tag in the ActionScript class file.

```
[SWF(width='800',height='600',backgroundColor='0x000000',frameRate='30')]
```

All you have to do now is install and run your favourite HTTP Connection/ Bandwidth Simulator program (and toggle your connection speeds) or upload the files to a couple of web servers and test and see what video you get. ●

About the author

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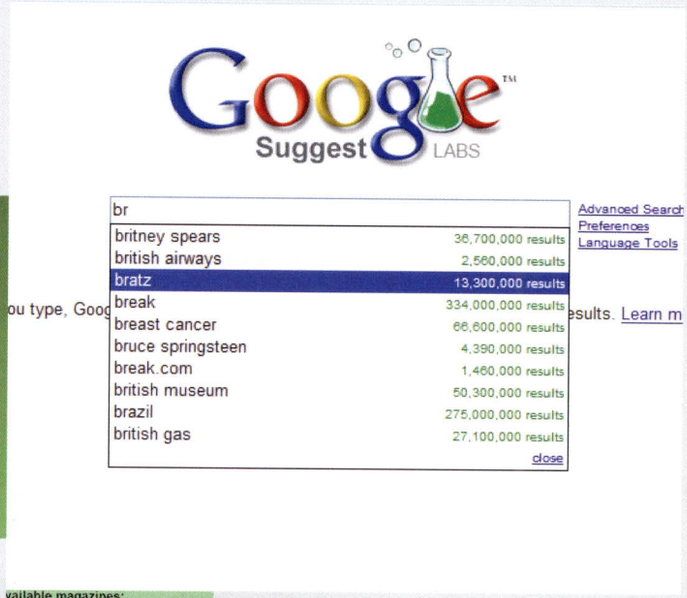
(above) **Optimise your site for iPhones** p132 – "For regular iPhone surfers, accessing website after website with teeny-tiny content can get a bit draining"

(right & below) **Build a site search system** p114 – "Ajax isn't a magic wand, but here are times when it can come in useful; it's all about playing to its strengths"



On your essential CD
All the files you need for these tutorials are in the Advanced Coding folder

tutorials >

102 Building dynamic forms
110 Load page items with Ajax
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122 Customer rating system
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(left) **Using drag and drop** p118 – "Draggable items, standard on desktops for decades, have recently come into their own online"

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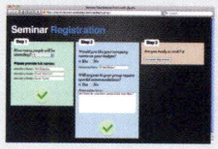


(above) **Building dynamic forms** p102 – "Just as a picture is worth a thousand words, a live example is worth a thousand tutorials"

/jQuery/ building dynamic forms

Your essential CD
All the files you'll require for this tutorial can be found on the CD.

Part one **Chris Coyier** from CSS-Tricks walks us through building a dynamic form. Here he puts solid HTML and CSS in place before using jQuery to add dynamic functionality in part two

Knowledge needed A basic working knowledge of HTML and CSS is ideal, but not required.

Requires Your code editor of choice

Project time The source code for this project is provided, so you can open up the example and get started right away.

Forms largely power the interactivity of the web, but most forms lack any dynamic features that could make them less intimidating, more friendly and more fun! Using the powerful (but easy to learn) jQuery JavaScript library, we can watch for events on our form inputs and dynamically change the form to suit our needs.

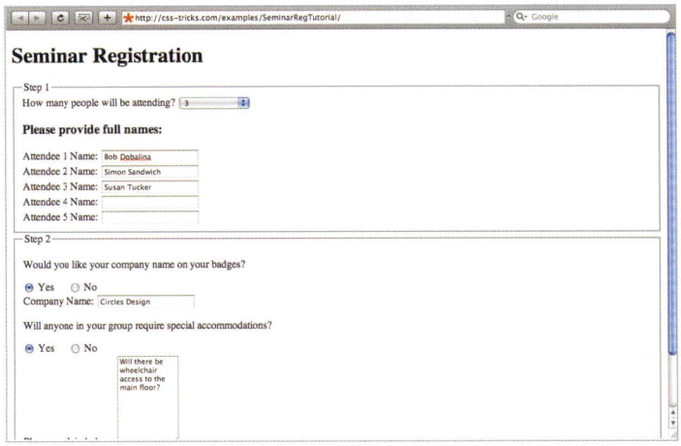
Instead of being abstract about these ideas, let's actually walk through building a dynamic form from start to finish. We'll be building a totally fictitious registration form for a totally generic seminar. The idea is to demonstrate the concepts, not to get anyone registered for a seminar, so forgive me if the example feels somewhat incomplete for a real seminar registration form. In the same way that a picture is worth a thousand words, a live example is worth a thousand written tutorials. The complete demo for this tutorial is available on the CD, as well as live on the web at css-tricks.com/examples/SeminarRegTutorial/.

Basic planning

Let's get our goals straight before we dive into any code. The idea is seminar registration, but from a company perspective.

One person will be filling out the form, but they may be registering multiple people. We'll need to capture the names of each attendee, and this will be required before the form can be submitted.

Additionally we'd like to ask some generic questions about the group as a whole. Then we're going to require a little enthusiasm (in the form of a checkbox) before form submission.



Step by step The questions on our form are grouped into three steps to help our users along; HTML provides the perfect element for achieving this in the **<fieldset>**

This breaks nicely into three steps, which we can use in our design to help lead users along. Let's break our questions into Step 1, Step 2 and Step 3. Step 1 is to find out how many people will be attending. The plan here is to show the question and a drop-down menu which defaults to 'Please Choose'. The drop-down will have the options of 1-5. When the number is chosen, inputs are revealed which ask for each of their names. This way, the user is only presented with input fields they actually need to fill out. We avoid visual clutter and the off-putting feeling of seeing loads of empty input fields.

> One of our considerations is that we don't forget the less technologically enabled

Step 2 involves two simple yes/no questions. The first is: would you like your company name on your badges? If the answer is yes, the user will be presented a field to supply that name.

The second is: will anyone in your group require special accommodation? If yes, the user will be presented a text area to explain. This will need to be larger to accommodate longer answers.

For Step 3, just for fun, we'll ask our registrants: are you ready to rock?. The 'complete registration' button will be inactive until this checkbox is checked. This could just as easily be something like 'I agree to the Terms & Conditions'. Additionally, the 'complete registration' button requires all questions from step 1 and step 2 to be complete before activating.

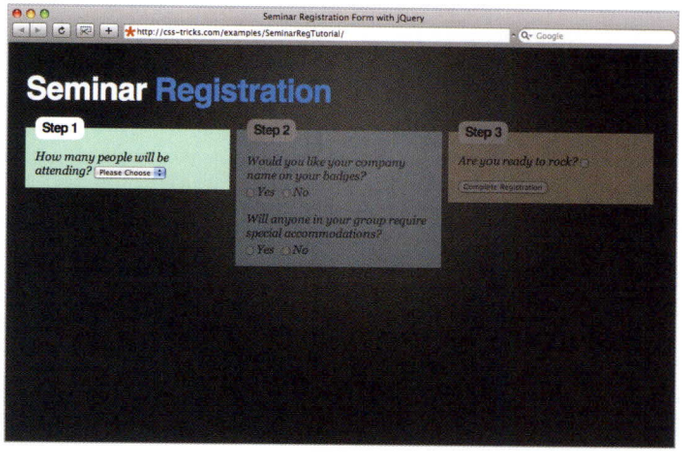
HTML markup

One of our most important considerations is that we don't forget our less technologically enabled brethren as we move forward with our fancy scripting. At the time of this writing, the NoScript plug-in for Firefox (which forcibly prohibits JavaScript from running in Firefox) has just over 30million downloads. We need to make sure that our HTML markup, CSS and JavaScript are all written so that the form absolutely works under any circumstances.

HTML provides the perfect element for breaking our form into steps, the <fieldset>. Let's take a look at the HTML for each step:

For Step 1:

```
<fieldset id="step_1">
  <legend>Step 1</legend>
  <label for="num_attendees">
    How many people will be attending?
  </label>
  <select id="num_attendees">
    <option id="opt_0" value="0">Please Choose</option>
    <option id="opt_1" value="1">1</option>
    <option id="opt_2" value="2">2</option>
    <option id="opt_3" value="3">3</option>
```



First hurdle Step 1 asks how many people will be attending. Our drop-down menu for this is made up of the **<select>** element and its child **<option>** elements

```
    <option id="opt_4" value="4">4</option>
    <option id="opt_5" value="5">5</option>
  </select>
  <br />
  <div id="attendee_1_wrap" class="name_wrap push">
    <h3>Please provide full names:</h3>
    <label for="name_attendee_1">
        Attendee 1 Name:
    </label>
    <input type="text" id="name_attendee_1" class="name_input"></input>
  </div>
  <div id="attendee_2_wrap" class="name_wrap">
    <label for="name_attendee_2">
        Attendee 2 Name:
    </label>
    <input type="text" id="name_attendee_2" class="name_input"></input>
  </div>
  <!-- wraps 3-5 follow the exact same for as the "attendee_2_wrap" -->
</fieldset>
```

The **<legend>** element is the semantically correct element to use to title a fieldset. Typically, browsers position the legend vertically centred along the top border of the fieldset, which is kind of cool and something we'll exploit for our design. There are some quirks to this, though, which we'll have to fight with an IE-specific style sheet.

The meat of Step 1 is our drop-down menu, which is the **<select>** element and its child **<option>** elements. But we'll need to ask our question first, which takes the form of a **<label>** element.

After the **<select>** element, we have a series of five divs, each of which has a class of **name_wrap** as well as a unique ID. Each of those divs contains an input and a label for one attendee name.

Having a wrapping div is the easiest way to handle hiding and showing these inputs, as we'll only need to target the wrap instead of both the input and the label. Giving the wrap both a generic class and a unique ID is useful for both our CSS and JavaScript, as sometimes it will be appropriate to target them all as a group, and sometimes it will be appropriate to target individuals. Notice the first one contains a header element asking the user to provide full names. This is just a convenient place to tuck it, since the first wrap will always be shown when any number of attendees is chosen.

For Step 2:

```
<fieldset id="step_2">
  <legend>Step 2</legend>
  <p>
    Would you like your company name on your badges?
  </p>
  <input type="radio" id="company_name_toggle_on"
name="company_name_toggle_group"></input>
```

Fixing Internet Explorer

There are two significant design problems when viewing our page in Internet Explorer. Both of are present in version 6, 7, and the most beta (2) of version 8, so we'll use conditional commenting to target IE as a whole and apply our fixes. The HTML inside of conditional comments is only seen by the targeted browser(s), so we can link to style sheets, JavaScript, even display content exclusively for Internet Explorer. Learn more about conditional style sheets and how to use them at css-tricks.com/how-to-create-an-ie-only-stylesheet/.

Legend/fieldset positioning

Fieldsets and their legends are some of the most hilariously buggy elements when dealing with Internet Explorer. Our problem is that IE pushes our legend box inside the fieldset because of the padding on the fieldset. One solution that may pop to mind right away is to use some negative top margin on the legend to pull it back up. This would work well, except for that fact that we're using transparency on the fieldsets, which (for some reason) hides all overflow and cuts off any of our legend hanging above. The other solution would be to set a relative position on it and kick it up with a negative top value. This solves the cut-off problem, but introduces a new one. Now any transparency applied to the fieldset is ignored on the legend. Headache-inducing, but this one we can fight. Within our conditional comments, we'll apply special CSS and JavaScript to deal with it:

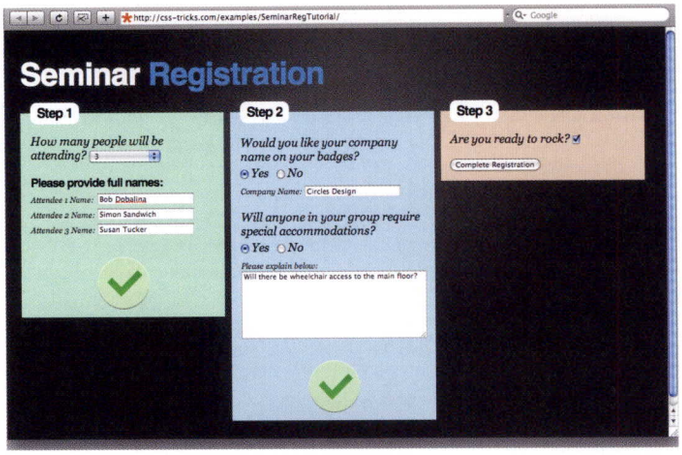
```
<!--[if IE]>
  <style type="text/css">
    legend {
      position: relative;
      top: -30px;
    }
    fieldset {
      margin: 30px 10px 0 0;
    }
  </style>
  <script type="text/javascript">
    $(function(){
      $("#step_2 legend").css({ opacity: 0.5 });
      $("#step_3 legend").css({ opacity: 0.5 });
    });
  </script>
<![endif]-->
```

Rounded corners

The other major design difference is the rounded corners on those legends. I'm usually more than happy to use the vendor-specific CSS methods for rounded corners and let IE be content with hard corners. That's what we call progressive enhancement 'round here. But if rounded corners are vital to the design, there are ways to bring them into the party even in IE. Since we're using jQuery, the easiest way would be to use a jQuery plug-in to handle it. Simply include the plug-in file and activation of it within the conditional comments so only IE loads and uses it. See a demo and download the jQuery plug-in here (www.methvin.com/jquery/jq-corner-demo.html).

```
  <label for="company_name_toggle_on">Yes</label>
   
  <input type="radio" id="company_name_toggle_off" name="company_
name_toggle_group"></input>
  <label for="company_name_toggle_off">No</label>
  <div id="company_name_wrap">
    <label for="company_name">
      Company Name:
    </label>
    <input type="text" id="company_name"></input>
```

>>



Final furlong Step 3 contains the final submit button; we have to disable this until the form is filled out. This is done in XHTML by including **disabled="disabled"** as an attribute

```
>>    </div>
      <p>
        Will anyone in your group require special accommodations?
      </p>
      <input type="radio" id="special_accommodations_toggle_on"
name="special_accommodations_toggle"></input>
      <label for="special_accommodations_toggle_on">Yes</label>
       
      <input type="radio" id="special_accommodations_toggle_off"
name="special_accommodations_toggle"></input>
      <label for="special_accommodations_toggle_off">No</label>
      <div id="special_accommodations_wrap">
        <label for="special_accomodations_text">
          Please explain below:
        </label>
        <textarea rows="10" cols="10" id="special_accomdations_text"></
textarea>
      </div>
    </fieldset>
```

Here we ask our two questions that have to do with the group as a whole. Should 'Yes' be chosen for either, our plan is to reveal an input area at that time. Otherwise, those input areas will be hidden. So we wrap those areas in divs with the IDs **company_name_wrap** and **special_accommodations_wrap** respectively.

Notice that the questions themselves are in paragraph (**<p>**) tags this time instead of labels. This can feel a little weird, but in the case of radio buttons, 'Yes and 'No' are the labels, not the question itself.

The only other piece of note is the ** ** character, which represents an 'em space'. Because our radio buttons and labels are both intentionally inline elements, this just allows us to push the 'No' option a bit over to the right, visually separating the options.

For Step 3:

```
<fieldset id="step_3">
  <legend>Step 3</legend>
  <label for="rock">
    Are you ready to rock?
  </label>
  <input type="checkbox" id="rock"></input>
  <input type="submit" id="submit_button"  value="Complete Registration"></
input>
</fieldset>
```

Fairly straightforward and simple here in Step 3. One thing to note is that this step contains the final submit button. While we intend to disable this button until the form is filled out, the HTML doesn't include any such disabling.

Disabling of inputs is done in XHMTL by including **disabled="disabled"** as an attribute. There is no such thing as disabled="false", or anything else which would re-enable the input. If an input has the disabled attribute at all, it's disabled. So, we'll be applying and removing this attribute from the input, all from the JavaScript.

There is some CSS that I'm not showing here, such as the reset, basic page layout, and typography. Refer to the code samples on the CD for the complete file. Next, we'll look at fieldsets and legends:

```
fieldset {
  width: 280px;
  padding: 15px;
  float: left;
  border: none;
  margin: 0 10px 0 0;
  }
  fieldset#step_1  {
  background: #b2e7ca;
  }
  fieldset#step_2  {
    background: #b2d9e7;
  }
  fieldset#step_3 {
    background: #e7c7b2;
  }
legend {
  font-weight: bold;
  font-size: 20px;
  background: white;
  -moz-border-radius: 10px;
  -webkit-border-radius: 10px;
  padding: 5px 10px;
  letter-spacing: -1px;
}
```

Fieldsets will be the 'boxes' that we use to house each of our three steps. While being the semantically correct element to use, they aren't without their quirks. For example, Firefox won't obey a min-height on a fieldset. In Internet Explorer, the padding on the fieldset affects the positioning of the legend element. Of note here is how we set all the common attributes of the fieldsets generically, while using the IDs of the fieldsets to change only the background colour. Efficiency is our friend!

Now we'll consider other form elements:

```
option {
  padding: 0 5px;
}
#special_accommodations_wrap textarea {
  width: 100%; height: 100px;
}
```

I like to apply a little padding back to the **<option>** elements, which are the ones that make up the drop-down menu. Without it, the text uncomfortably butts up against the edge of the drop-down.

In XHTML, textareas are required to contain both the 'rows' and 'cols' attributes, although using these attributes to do any accurate sizing is no good. Thankfully, they're easy to override by setting width and height in the CSS.

Our solid HTML is in place, ensuring functionality all by itself, and our CSS is beautifying our design. In part two overleaf, we'll get into the dynamic functionality of this form using jQuery. ●

About the author

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How do you like your eggs? Scrambled with ketchup

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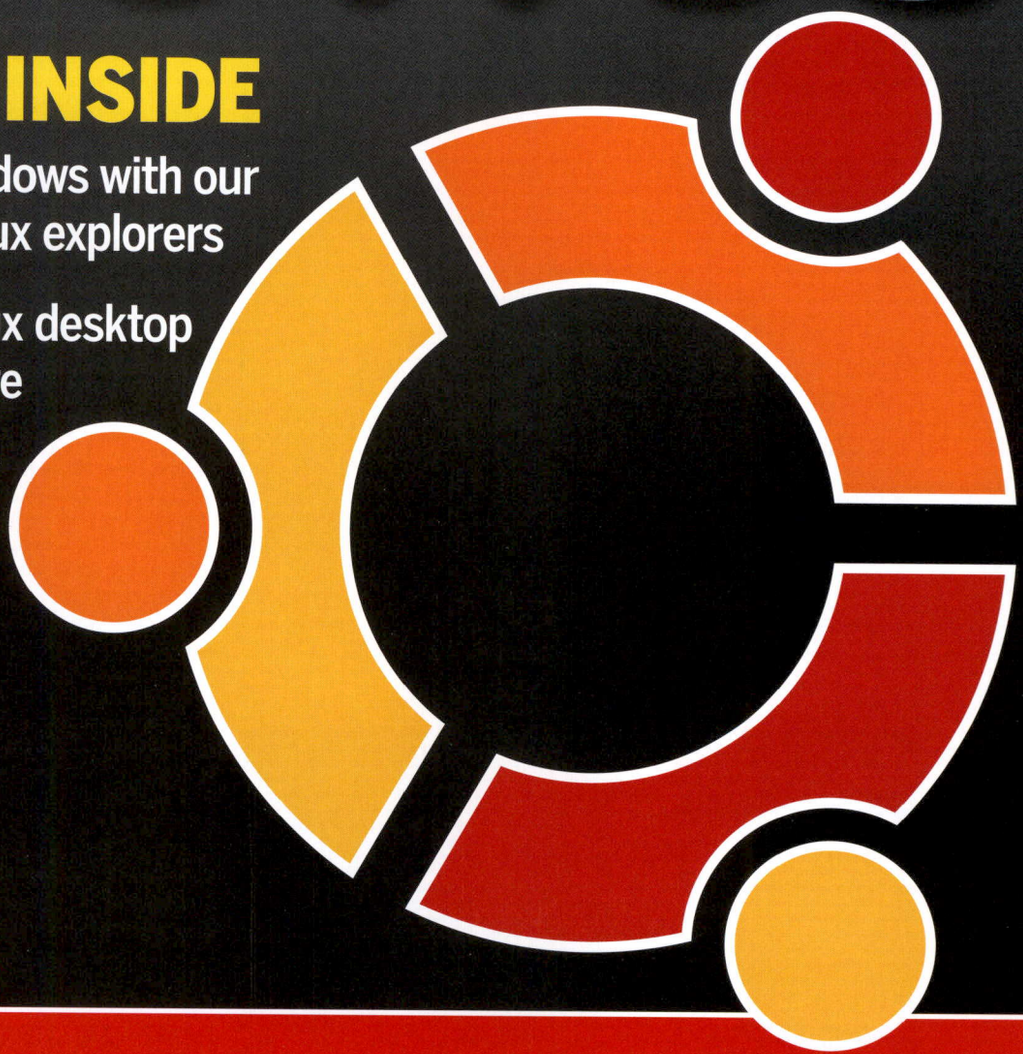

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/jQuery/ building dynamic forms

Your essential CD
All the files for this tutorial are on the CD.

Part two With solid HTML in place, ensuring functionality all by itself, and our CSS beautifying our design, **Chris Coyier** from CSS-Tricks explains how to add dynamic functionality to your form

Knowledge needed	Basic working knowledge of HTML and CSS
Requires	Your code editor of choice
Project time	The source code is on the CD, so you can get started right away

On pages 102-4, I walked through the basics of building a dynamic form. Now it's time to bring our form to life with the judicious use of jQuery. To prepare ourselves for all this dynamic fun, we have some work to do.

```
$(function(){
  $(".name_wrap").hide();
  $("#company_name_wrap").hide();
  $("#special_accommodations_wrap").hide();
  $("#num_attendees").val('Please Choose');
  $("#step_2 input[type=radio]").each(function(){
    this.checked = false;
  });
  $("#rock").each(function(){
    this.checked = false;
  });
  $("#submit_button").attr("disabled",true);
  $("#step_2").css({ opacity: 0.3 });
  $("#step_3").css({ opacity: 0.3 });
  $.stepTwoComplete_one = "not complete";
  $.stepTwoComplete_two = "not complete";
```

That first line reads "When the DOM is ready..." which ensures that the elements we intend to manipulate are ready to receive that manipulation. Next we start hiding stuff.

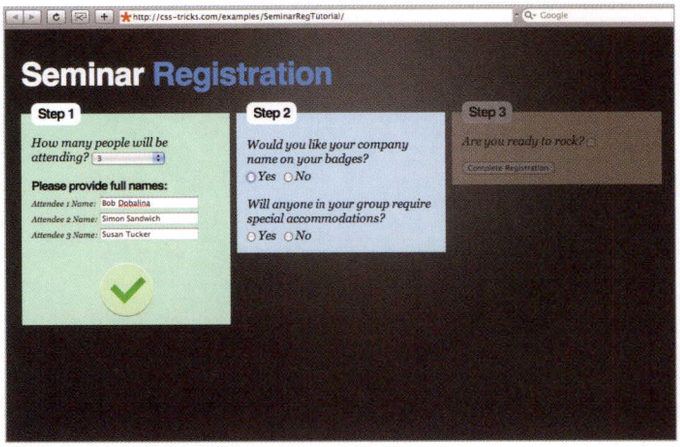
All those attendee name fields from step 1? Gone. The company name and special accommodation text inputs? Gone. Not gone forever, but just gone until the user indicates we need them.

The jQuery **.hide();** function is used for this and is as incredibly simple as it seems. It simply applies **display: none;** as inline CSS right into the element. [NOTE: Because we intend to UNhide these elements, using the **.hide();** function is best. If we'd intended to leave them hidden forever because they became irrelevant with JavaScript enabled, we'd instead apply a class to the items with absolute positioning and huge negative left and top values. This would effectively 'hide' them, but still allow screen readers to see them. 508 compliance and all ...]

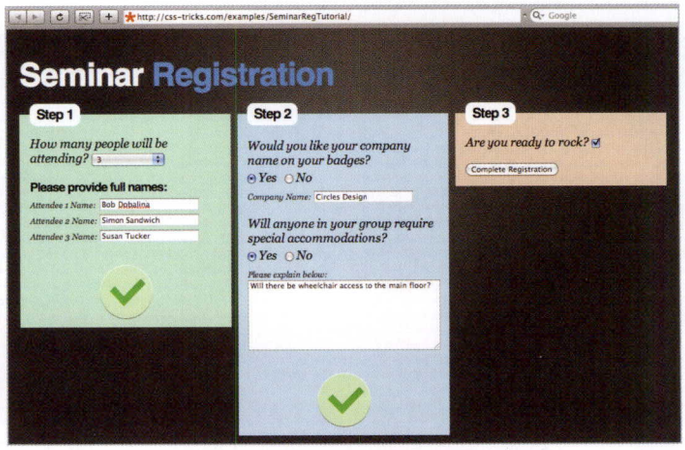
Browsers have a habit of 'remembering' the values of inputs even after page refreshes. To avoid any confusing situations, when our page loads we're going to reset all our key form elements to their default values. This means setting our drop-down box to the default 'Please Choose', our radio buttons back to neither option being selected, and our checkbox back to unchecked.

We 'light up' step 2 by setting its opacity back up to 1.0. It's like a party in your browser!

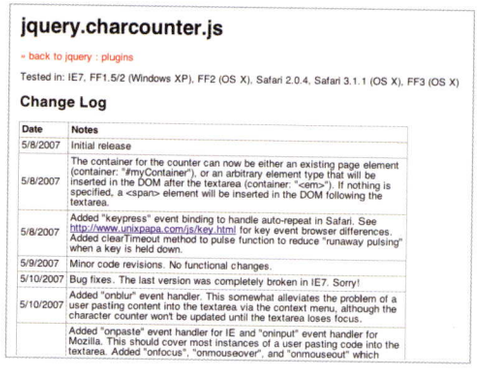
We do this by using jQuery selectors to find each of these elements as efficiently as we can and setting the **this.checked** value to **false**. After we've done these things, we can safely disable the submit button, as we're sure that the questions we want answered have not been answered. Next we 'dim' steps 2 and 3 by applying CSS opacity to them. The intention here is to keep visual



Shady business Until step 2 is completed, we "dim" step 3 by applying CSS opacity. jQuery can recognise which browser it's dealing with and will apply the correct technique



End game In step 3, we simply require that the checkbox be checked, and that step 1 and step 2 have been filled out adequately as well



jquery.charcounter.js

« back to jquery : plugins

Tested in: IE7, FF1.5/2 (Windows XP), FF2 (OS X), Safari 2.0.4, Safari 3.1.1 (OS X), FF3 (OS X)

Change Log

Date	Notes
5/8/2007	Initial release
5/8/2007	The container for the counter can now be either an existing page element (container: "#myContainer"), or an arbitrary element type that will be inserted in the DOM after the textarea (container: ""). If nothing is specified, a element will be inserted in the DOM following the textarea.
5/8/2007	Added "keypress" event binding to handle auto-repeat in Safari. See http://www.unixpapa.com/js/key.html for key event browser differences. Added clearTimeout method to pulse function to reduce "runaway pulsing" when a key is held down.
5/9/2007	Minor code revisions. No functional changes.
5/10/2007	Bug fixes. The last version was completely broken in IE7. Sorry!
5/10/2007	Added "onblur" event handler. This somewhat alleviates the problem of a user pasting content into the textarea via the context menu, although the character counter won't be updated until the textarea loses focus.
	Added "onpaste" event handler for IE and "oninput" event handler for Mozilla. This should cover most instances of a user pasting code into the textarea. Added "onfocus", "onmouseover", and "onmouseout" which

Counting on it
Thomas Deater's character counter plug-in (www.tomdeater.com/jquery/character_counter/) enables you to restrict the number of characters entered into an input

focus on step 1 where we want our users to begin. We aren't complete tyrants about it, though: the inputs in the other steps are still functional in this example.

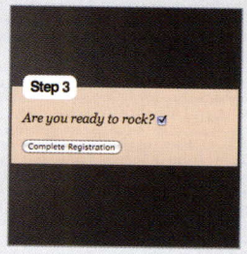
Setting CSS opacity in jQuery is especially satisfying. Many browsers treat opacity in different ways. jQuery is smart enough to recognise which browser it's dealing with and will apply the correct technique.

Finally, we need a couple of variables to keep track of our questions in step 2. Since there are two different actions, it makes the most sense to keep track of their completion status with variables. Beginning the variable with $. keeps the variable global, ensuring they can be used from function to function.

```
$("#num_attendees").change(function() {
  $(".name_wrap").slideUp().find("input").removeClass("active_name_field");
  switch ($("#num_attendees option:selected").text()) {
    case 'Please Choose':
      break;
    case '1':
      $("#attendee_1_wrap").slideDown().find("input").addClass("active_
name_field");
      break;
    case '2':
      $("#attendee_1_wrap").slideDown().find("input").addClass("active_
name_field");
      $("#attendee_2_wrap").slideDown().find("input").addClass("active_
name_field");
      break;
    case '3':
      $("#attendee_1_wrap").slideDown().find("input").addClass("active_
name_field");
      $("#attendee_2_wrap").slideDown().find("input").addClass("active_
name_field");
      $("#attendee_3_wrap").slideDown().find("input").addClass("active_
name_field");
      break;
    case '4':
      $("#attendee_1_wrap").slideDown().find("input").addClass("active_
name_field");
      $("#attendee_2_wrap").slideDown().find("input").addClass("active_
name_field");
      $("#attendee_3_wrap").slideDown().find("input").addClass("active_
name_field");
      $("#attendee_4_wrap").slideDown().find("input").addClass("active_
name_field");
      break;
    case '5':
      $("#attendee_1_wrap").slideDown().find("input").addClass("active_
name_field");
      $("#attendee_2_wrap").slideDown().find("input").addClass("active_
name_field");
      $("#attendee_3_wrap").slideDown().find("input").addClass("active_
name_field");
      $("#attendee_4_wrap").slideDown().find("input").addClass("active_
name_field");
      $("#attendee_5_wrap").slideDown().find("input").addClass("active_
name_field");
      break;
    }
});
```

The 'for' attribute

Chris Coyier explains what it's, er, for



Labels and inputs live in harmony with each other best if you give the label element a **for** attribute that's the same value as the **id** of the input it is labelling. This is important for two reasons.

1) Accessibility. Inputs and labels don't necessarily live directly next to each other in the HTML. For example, it often makes sense for labels to precede text inputs, but labels often follow radio buttons. This can be confusing for someone viewing the page from a screen reader. The **for** attribute connects label to input without confusion.

2) Usability. A label that references an input via the **for** attribute often becomes clickable to activate the input. For example, a label that references a checkbox will check and uncheck that checkbox. A label that references a text input will place the cursor inside the text input when clicked. Consider using the cursor CSS attribute to make this clear:

```
label {
  cursor: pointer;
}
```

The big interactive element of step 1 is our drop-down. The first line above reads 'When the value of the drop-down changes...' Basically we're waiting for that event of the user picking a new value from that drop-down. When they do, the first thing we do is **slideUp** all of our **name_wrap** divs. Then we find all the inputs within those divs and remove the class **active_name_field**. This doesn't mean much (or do much) the first time a selection is made, but it will make sense if the user changes their selection.

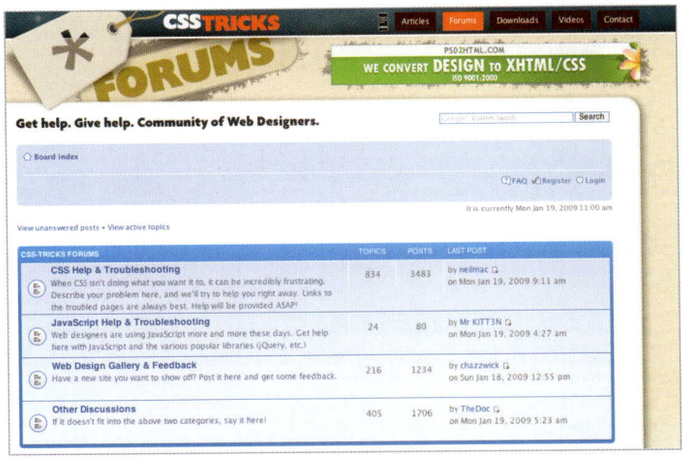
When this change event fires, we're able to capture the most essential piece of information, which is the text value of the selected option. We then write a switch statement to act on each of those possible values. A switch is a bit like an if...else if statement, just a bit more succinct. If "Please Choose" is chosen, do nothing. Otherwise **slideDown** the number of inputs that we need, and add the class **active_name_field**.

Built-in functions such as **.slideUp()** and **.slideDown()** are a big part of what makes jQuery so easy to get started with. They behave much like the **.hide()** function we already saw, only they animate the **height** value from its current height down to zero, or from zero up to its previous height respectively.

So what's the deal with this **active_name_class** field we keep adding and removing from the inputs? We didn't use this in the CSS for anything ... Well the plan is to use this class to perform a little primitive validation on step 1. Let's do that.

```
$(".name_input").blur(function(){
  var all_complete = true;
  $(".active_name_field").each(function(){
    if ($(this).val() == '' ) {
      all_complete = false;
    };
  });
  if (all_complete) {
    $("#step_1")
```

>>



Tricks of the trade CSS-Tricks (css-tricks.com/) is a treasure trove of advice, resources and tutorials to help you create beautiful designs using standards-compliant code

```
>>      .animate({
          paddingBottom: "120px"
        })
        .css({
          "background-image": "url(images/check.png)",
          "background-position": "bottom center",
          "background-repeat": "no-repeat"
        });
        $("#step_2").css({
          opacity: 1.0
        });
      };
});
```

Our goal here is to check and see if the user has filled out the names of each attendee. If they're registering one person, we only need to check one input field. If they're registering two people, we need to check two, and so on. That's how this **active_name_field** is going to help us. Since we apply this class as soon as the user sees that field, we merely need to check each field with that class to make sure it has a value other than nothing. We perform this check as soon as any of the elements have a **blur** event, which is to say that either the input had the cursor in it and was clicked away from, or it was tabbed away from.

The plain English translation of our validation goes like this: "When the user leaves any name field, assume they're done, but then loop through each 'active' name input and if any of them are blank, know that they're not done."

After the loop, if they're indeed done (all the fields are filled out), we're going to bring on the fun! First we animate the bottom padding of the fieldset, having it grow downward, then we apply a big ol' checkmark at the bottom, giving some strong visual feedback that the user has done good work. Then we "light up" step 2 by setting its opacity value back up to a full 1.0. Try it! It's like a party in your web browser!

```
$("#step_2 input[name=company_name_toggle_group]").click(function(){
  $.stepTwoComplete_one = "complete";
  if ($("#company_name_toggle_on:checked").val() == 'on') {
    $("#company_name_wrap").slideDown();
  } else {
    $("#company_name_wrap").slideUp();
  };
  stepTwoTest();
});
$("#step_2 input[name=special_accommodations_toggle]").click(function(){
  $.stepTwoComplete_two = "complete";
  if ($("#special_accommodations_toggle_on:checked").val() == 'on') {
    $("#special_accommodations_wrap").slideDown();
  } else {
    $("#special_accommodations_wrap").slideUp();
  };
  stepTwoTest();
});
```

We have two special inputs we need to be watching in step 2: the set of Yes/No radio buttons asking about the company name and the set of Yes/No radio buttons asking about special accommodations. We'll watch for the **click** event on these before we act.

Let's do the plain English thing again. "When a radio button is clicked, set the relevant completion variable to **complete**. If they happened to pick "Yes" then slide down the new input area, otherwise slide it back up."

Both functions are nearly identical, but merely watch different inputs and affect their respective variables in input areas. Notice how we aren't picky at all about setting that variable to **complete**. As soon as the user clicks anything, we're considering that complete. Yes, No, doesn't matter.

At the end of each click event, notice how we call a new function, **stepTwoTest**. Let's take a peek.

```
function stepTwoTest() {
  if (($.stepTwoComplete_one == "complete") && ($.stepTwoComplete_two ==
 "complete")) {
    $("#step_2")
    .animate({
      paddingBottom: "120px"
    })
    .css({
      "background-image": "url(images/check.png)",
      "background-position": "bottom center",
      "background-repeat": "no-repeat"
    });
    $("#step_3").css({
      opacity: 1.0
    });
  }
};
```

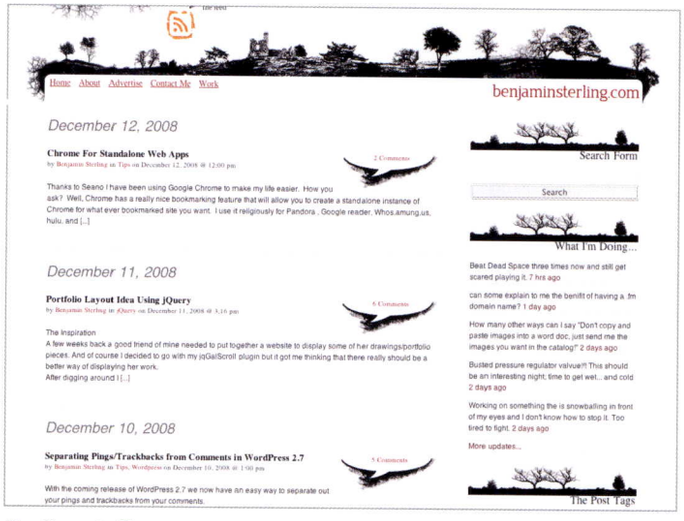
Very simple function here, but it saves us having to repeat code in each of the click events by abstracting it to its own function. What we do here is check on both our variables. If they're both set to **complete** we launch the same pomp

Resources Where to find out more

Web Form Design: Filling in the Blanks by Luke Wroblewski
This is the best book ever written on web form design. Luke tells you right away that online forms suck and he's absolutely right. Very few people enjoy the process of filling out a form.

This book is full of practical information on how to create better forms on the web. It teaches you to put yourself in the shoes of your potential form fillers and think of everything they might think – every possible confusion, apprehension and question. It explains how to avoiding asking for anything you don't absolutely need to ask; how to prefill fields with reasonable common answers; how to lead the eye with the design ... there are so many practical tips I can barely begin to list them here.

In case study after case study, Luke teaches us how to be better form designers. The book was published in May 2008, so the examples still feel current and timely. Although I suspect that in May 2013, this book will still be the Bible of form design.
www.lukew.com/resources/web_form_design.asp



Sterling stuff Benjamin Sterling's site (benjaminsterling.com) is packed with useful advice on using jQuery and other web development tools

and circumstance as we did for step 2 with the animations, graphics, and 'lighting up' step 3.

```
$("#rock").click(function(){
  if (this.checked && $("#num_attendees option:selected").text() != 'Please
Choose'
      && $.stepTwoComplete_one == 'complete' && $.stepTwoComplete_two
== 'complete') {
      $("#submit_button").attr("disabled",false);
    } else {
      $("#submit_button").attr("disabled",true);
  }
});
```

In step 3, not only are we trying to build a little enthusiasm for our seminar but we're also going to do a little more primitive validation. We require that the checkbox be checked, but beyond that, we're going to require that step 1 and step 2 have been filled out adequately as well. Fortunately, we've essentially already done this. In one big **if** statement, we verify the checkbox is checked, the drop-down is not equal to "Please Choose" and both questions in step 2 have been answered. If this is true, we remove the **disabled** attribute from the submit button; otherwise we make sure it's still there.

So that'll do it! We've added many dynamic elements to a form to make it more intuitive and friendly to use, and more fun! Plus, we've managed to do so in such a way the form is still fully functional and usable without any JavaScript at all. This so-called "Progressive Enhancement" is key to web development in providing the best experience we can to all of our users.

Remember to check out the full example code provided on the CD. I'd like to give special thanks to Benjamin Sterling (benjaminsterling.com) in regards to this. Benjamin is a jQuery master and I was glad to have his expert eyes looking over the code for me.

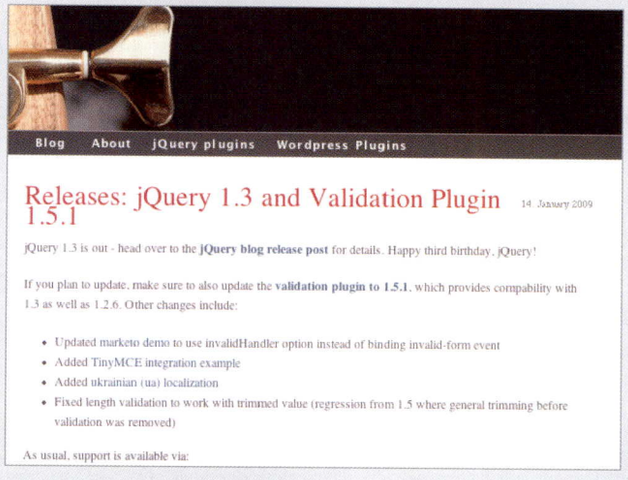
Notes on extending the concepts

If this is your first experience with jQuery, I hope you can see how simple it is to write and how natural it feels. The use of the CSS selector engine is a huge part of that, so if you're comfortable in CSS, jQuery will be easy for you to start picking up. Here are some more ideas for making your forms more dynamic:

- *Append a State drop-down menu only when "United States" is chosen from a Country drop-down.*
- *Dynamically update and display a Total Price value based on options from your form.*
- *Check an entered username against a database and let the user know if that username has been taken or not.*
- *Analyse a password and let the user know how secure it is.*
- *Expand the height of a textarea when a certain number of words are entered.*
- *Add help text next to input areas that are only visible when that input is in focus.* ●

jQuery plug-ins

Great resources for extra functionality



Validation

I've called the validation we're doing in this tutorial "primitive" a few times. That's because, while it does its job, it isn't done very extensibly or with any useful user feedback. If you're interested in doing client-side validation of your forms, definitely check out the Validation plug-in from Jörn Zaefferer (bassistance.de/jquery-plugins/jquery-plugin-validation/).

Validation is an incredibly nice and easy-to-use plug-in. At its most basic, you simply add class names to inputs you wish to make required, call the **.validate();** function on the form and you're done!

Character counter

In Step 2, we ask our users if they'd like their company name to be printed on their badges. Perhaps because of space limitations, only 60 printed characters will fit on the badge. We could save ourselves some time and headaches if we only allowed 60 characters to be entered into that input. The character counter plug-in by Thomas Deater does just that (www.tomdeater.com/jquery/character_counter/). Not only will it count the number of characters in real time, but it can disallow any characters beyond that limit.

Better drop-downs

The drop-down in our example is very simple, with only five options, but it's very easy for drop-down menus to get out of hand with too many options.

One jQuery plug-in, SexyCombo (code.google.com/p/sexy-combo/) helps this problem on two fronts. One, it provides auto-complete based on the options inside of it. Type the letter "W" and get Washington, West Virginia, Wisconsin and Wyoming in the example drop-down for "Choose the state". Two, it allows for styling of the drop-down in ways that regular CSS isn't able to do. It even replaces the arrow drop-down with a custom image instead of the browser default.

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Who would play you in a movie? John Goodman

/jQuery/load page items with Ajax

Your essential CD
All the code from this month's tutorial can be found on the CD.

Taking the Apple website as his inspiration, **Remy Sharp** of Brighton-based web agency Left Logic (leftlogic.com) explains how to produce a single page that loads items on demand

Knowledge needed: Basic PHP, JavaScript, jQuery
Requires: Text editor
Project time: 2-4 hours

The Apple site is a wealth of funky effects that can be achieved using JavaScript. The particular effect we're going to deconstruct and reproduce is the progressive load of products in its store.

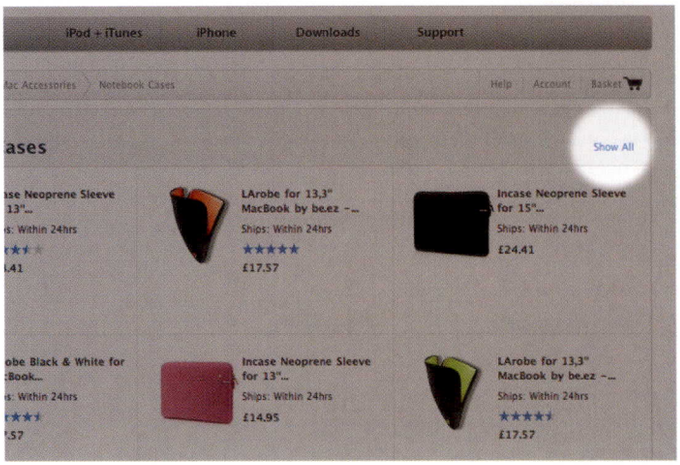
If you've looked through a specific category in the Apple store, scrolling a long page of products, you'll find they're being loaded on demand: tr.im/bdnx. We'll look at how Apple is performing this technique. With that understanding, we can create a similar effect with a few simple changes to our server-side and a good helping of jQuery.

To understand what Apple is doing, we need to examine how the page is delivered and look at it with JavaScript disabled. The first thing we notice is that there's only a small subset of the products on the page – nowhere near the amount on the JavaScript-enabled page.

Looking a bit closer, we find that there's a 'Show All' link in the top corner, which leads us to a page with *all* the products on. I'd argue that Apple has taken a bit of a shortcut in only offering these two versions of the page if JavaScript isn't enabled. However, it's likely that if you're looking at implementing a similar solution, you already have pagination on your site – because it's easier for your visitors to navigate.

With JavaScript enabled and using Firebug to watch Ajax requests, we can see when scrolling down the page the requests being made. Very simply, the Ajax responder is passing back a simple object that contains the HTML that needs to show the products. This is what we're interested in.

While scrolling down the page quickly, you can see a product placeholder with the typical loading throbber, which gradually fades through to reveal the actual product (loaded via Ajax).



Without JavaScript Visit the Apple page with JavaScript disabled and a 'Show All' link leads you to a page with all the products

Expert tip Ajax request

Most, if not all, JavaScript libraries will send a specific header when performing an Ajax request: **X-Requested-With: XMLHttpRequest**.

This way, our server-side code can detect the Ajax request, and respond with a cut-down version of the page (normally the page would return with a header and footer).

In simple PHP syntax, this would look like:

```
if (isset($_SERVER['X-Requested-With']) && $_SERVER['X-Requested-
With'] == 'XMLHttpRequest') {
 // then we're an ajax request – just send back a snippet of markup
} else {
 // we're a normal request, send the entire page back with the header
and footer.
}
```

It's important to note that the height and width of the product placeholder is *fixed*. This prevents the cross-fading effect from making the page jump around. The page would jump due to the different heights the products can be. This is also particularly important due to the way the effect is *prepared* by the JavaScript (which we'll come to later).

The final part of the solution is the JavaScript call that triggers the effect. This tells the JavaScript how many pages are available for this category of content.

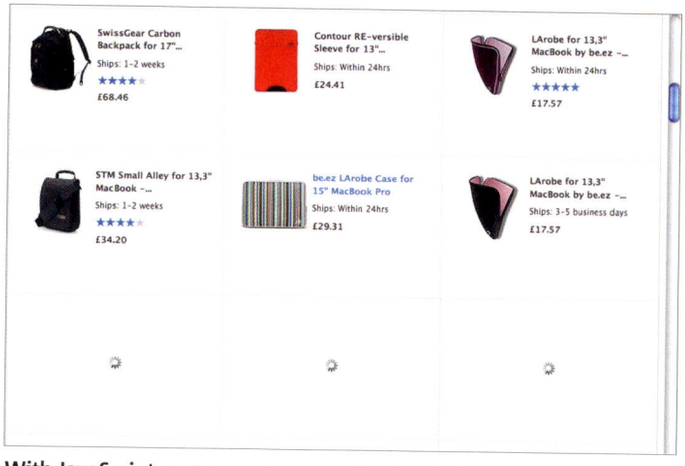
Why bother?

Before turning to JavaScript to solve a problem, it's always worth making sure there's an advantage to our visitor. Here there are three. Firstly, it reduces reloading the page: fewer clicks for the user and just a simple scrolling process. Secondly, it reduces load on the server when compared to a page

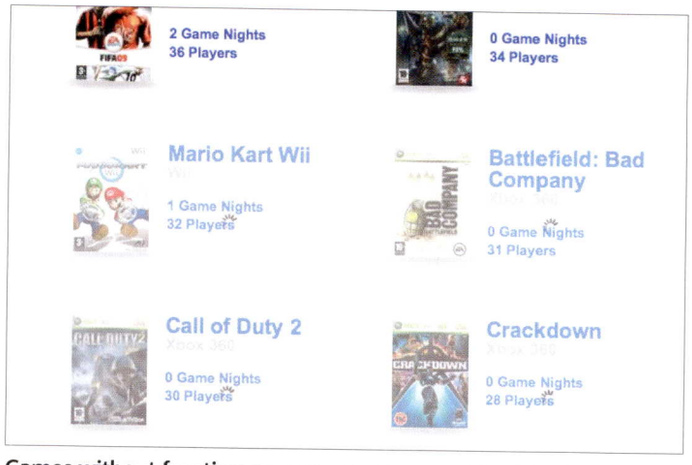
> "We're going to reproduce the progressive load of products in the Apple Store"

that shows every product on a single page. By using Ajax to load content the visitor can't see later on, the visitor is downloading less in one chunk from our servers. And thirdly, it creates a natural visual cue to the user via the height of the scrollbar as to how much content is on the page.

Alternative methods would be to load in the next page of data when the user hits the bottom (or a specific) point on the page. However, by preloading the height of the page, the visitor will know they've *definitely* hit the end of the page. In comparison, infinitely loading pages aren't really infinite: they'll just stop when they've hit the last lot of data that comes back from the server, which could be misinterpreted as a bug by the visitor.



With JavaScript Scroll down a long page of products in the Apple store with JavaScript enabled and you'll see the items loading on demand



Games without frontiers The loading throbber on our Thumbslap videogames page gradually fades through to reveal the actual product (loaded via Ajax)

Another option would be to use the lazyload plug-in for jQuery (which defers image loading). The reason we don't want to do this is that we'd still have to deliver the entire markup and content for the page – which could be 10 pages of content in one download.

Our solution will download the normal, non-JavaScript page and then progressively enhance it by removing the pagination and creating placeholders for each page of content.

Let's assume you already have a web page of products with some form of server-side pagination in place. I'm going apply the changes to a live site called Thumbslap, and in particular its Most Popular Games page: thumbslap.com/games/. Visit the URL and you can see the final effect. And if you disable JavaScript you'll see how it worked before the JavaScript was applied.

To hijax this page, we have to complete the following: 1) Ajax responder with each page of games. 2) Any markup required to achieve the fade-in effect. 3) Initialisation code – ie preparing the throbbers, creating hidden containers. 4) Trigger an event when the page of throbbers are scrolled into view. 5) Perform the Ajax hit and cross-fade the games into view.

The Ajax responder is very simple. We're going to return plain HTML, and we aim to reuse the code that generates the list in the non-JavaScript version of the page. There are many ways to achieve the cross-fade effect. Here we'll use absolute positioning (within a wrapper div) and **z-index** to make sure elements are clickable after they've faded through. The JavaScript will prepare the markup and trigger the *actual* cross-fade effect, but we'll still need to test the method to ensure it works as expected.

We need a wrapper div, whose positioning is set to relative, that initially holds two elements: an empty container (which will eventually hold the loaded games), and a **ul** to hold the throbbers, one in place for every game to be loaded. The **ul** is populated with a single image element containing our throbber (a great resource for building your own throbber can be found at http://ajaxload.info).

```
<div>
 <ul class="games">
  <li>Item #1</li>
  <li>Item #2</li>
  <li>etc...</li>
 </ul>
 <!– the markup below will be generated using jQuery –>
 <div class="empty-games">
  <!– first page of items –>
  <div class="gamesPage">
   <div class="loadedGames">
    <!– empty, will contain the Ajax response –>
   </div>
   <ul class="games">
    <li>throbber image</li>
    <li>throbber image</li>
    <li>etc...</li>
   </ul>
  </div>
  <!– and repeat above for total number of pages –>
 </div>
</div>
```

The CSS will place the **ul** element with the throbbers underneath the **div.loadedGames** element, and the cross-fade will animate the opacity down for the throbbers, while the opacity is increased for the **div.loadedGames** element.

Initialisation and event jQuery

Most of the markup described above will be generated by the JavaScript using jQuery. The page must be served with a couple of variables embedded so that we know how many pages to prepare and how many items will appear on a 'page'. Somewhere, before we call the code to initialise the page, we'll have the following variables:

```
<script type="text/javascript">
 var pages = 10,
    itemsPerPage = 15;
</script>
```

To generate the markup, we need to do the following: 1) Create the **div.empty-games** element after the initial **ul.games** element. 2) Append the **div.gamesPage** within **div.empty-games** for the number of times we have pages (ie 10 in our case). 3) Within each **div.gamesPage**, append the throbber and attach an event that triggers the Ajax request. jQuery makes it very easy to modify the DOM, and we can inject plain HTML markup into jQuery's functions, because we know it will insert without any problems in different browsers. Using the verbs from our list above, we can change the DOM:

```
$('.games').after('<div class="empty-games" />');
```

Two things should be noted about the syntax. The first is that the $ function is a shorthand for the jQuery function. Second, we don't have to write the HTML as:

```
<div class="empty-games"></div>
```

This is because jQuery will expand out the XHTML for us. However, both syntax methods work. Now that **div.empty-games** has been inserted, we can modify the DOM further:

```
$('.empty-games').append('<div class="gamesPage"><div class="loadedGames"
/><ul class="games" /></div>');
```

This gives us *one* page ready to be loaded with throbbers. However, we need 10 (or the number specified in the **pages** variable). >>

>> We could write a 'for' loop to create the markup, but we'd need this again when we came to create 15 throbbers per page. Instead, we'll use a repeat utility that extends the String prototype:

```
String.prototype.repeat = function( num ) {
 return new Array( num + 1 ).join( this );
}
```

This code will return a string multiplied by n times. Where pages = 10, this makes our code much easier to read:

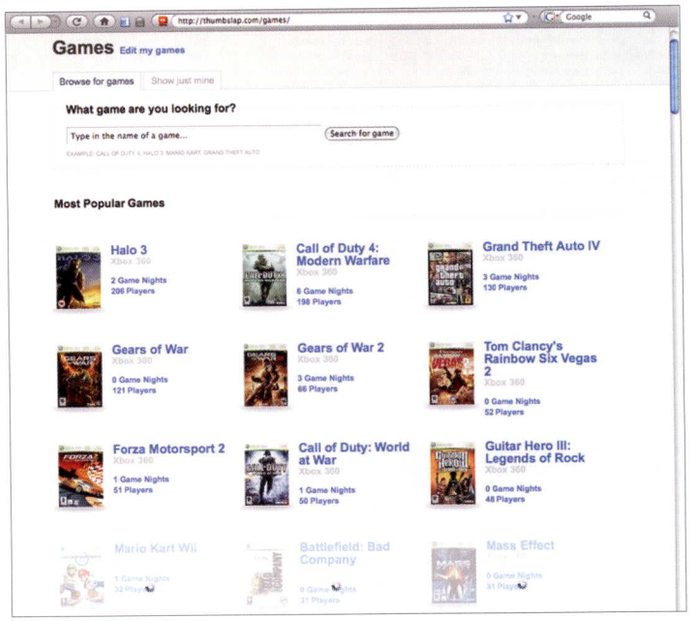
```
$('.empty-games').append('<div class="gamesPage"><div class="loadedGames"
/><ul class="games" /></div>'.repeat(pages) );
```

With the use of some chaining, we can continue this same line of code to change jQuery's context to the **div.gamesPage** collection of elements and within each of those elements, append the throbber and hook in the Ajax event – which is where the bulk of the effect is performed.

```
...repeat(pages) ).find('.gamesPage').each(function (i) {
 var $games = $(this);
 $games.find('ul').html(
  '<li class="gameHolder"><img class="loader" src="http://test.com/images/
spinner.gif" /></li>'.repeat(itemsPerPage)
 );
 // where the real magic happens
 $games.one('inview', function (event, visible) {
  if (visible) {
   $.ajax({
    url: '/games/' + (i + 2) + '/',
    dataType: 'html',
    success: function (html) {
     $game.find('.loadedGames').html(html).animate({
      opacity: 1
     }, 500);
     $game.find('img').animate({
      opacity: 0
     }, 500);
    }
   });
  }
 });
});
```

The very first thing we do is to capture the index of the current div in the variable **i**. We'll need this to indicate which page we're viewing when the Ajax request is sent. Second, cache a copy of the current div. A common notation for 'jQueryfied' elements is to prefix the variable with a **$** symbol so when looking at the code you can quickly see which variables have jQuery functions available and which don't. Finally, we bind an event using the **.one** function. This is a custom event that we'll have to supply ourselves. By using the **.one** function, the event will trigger once and then automatically unbind itself, as we only want to get the items via Ajax once per page.

When our **div.gamesPage** comes into view we make an Ajax request, passing in the current page we need, and then insert the result into **div.loadedGames**. After this, we animate the opacity of *both* the throbbers and the newly loaded items. Note that we're not passing in any query string to the Ajax request. This is because the ide, in this particular instance, supports RESTful URLs, so the URL to the fifth page, Ajax or not, is http://thumbslap.com/games/pages/5/. In addition, we're using i + 2 (because the index starts at zero, and we've already shown page 1 – shown when JavaScript is disabled).



Final result With a few simple changes to our server-side and a good helping of jQuery we've reproduced the progressive load of products in the Apple store

The 'inview' event

The inview custom event can be written in several different ways. One approach is to use a setTimeout to check for elements that have come into view. The method we're using hooks into the scroll event and searches for elements that have registered to listen for the 'inview' event. The custom event then checks each registered element's offset and compares it to the current scroll position, triggering the event if it has come into view.

To finish off, we should save the code in a separately included JavaScript file. Ideally, include all the JavaScript at the end of the document – this way you don't have to wrap the code with the DOM-ready event (though you can, and it won't make any significant difference). By putting the scripts at the bottom, it also avoids any unnecessary rendering blocking by slow JavaScript.

Remember, by applying this effect we've removed the ability to jump to a specific page. So it's still important to allow your visitors to find your content in other ways if they have a specific idea of what they're looking for. This technique is very much for browsing, not for finding. Keep supporting searching for products, and even better: support autocomplete searching! ●

Expert tip A note about Internet Explorer

Internet Explorer has some problems rendering opacity with cleartype. There's a simple fix, but it's worthwhile keeping this in mind when you're animating. In the first animation, we perform a callback to fix the clear type issues by using some browser sniffing for Internet Explorer:

```
function fixClearType() {
 if ($.browser.msie) {
  this.style.removeAttribute('filter');
 }
}
```

and the animate is changed to:

```
$game.find('.loadedGames').html(html).animate({
 opacity: 1
}, 500, fixClearType);
```

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Site jqueryfordesigners.com and remysharp.com
Twitter twitter.com/rem
Areas of expertise JavaScript, jQuery, LAMP stack
What's your favourite takeout food? Cornetto (silly question demands a silly answer)

Greg Wolejko on...

The challenge of Chrome

Google's new browser presents both new headaches and new opportunities for developers, says Cognifide's **Greg Wolejko**

There's been much talk about Google Chrome since it launched in September 2008, and as a developer it's been interesting to watch. Within weeks, Chrome had already shown there was still room in the market for a faster browser, and must have had developers from the Firefox and Internet Explorer teams going back to their desks.

Chrome has introduced advanced solutions that place JavaScript development at a whole new level, which opens the possibility of creating more complex, interactive and richer websites and applications. Chrome has also introduced the concept of different processes for individual tabs in addition to a Flash player inside of the page, offering greater stability so that as one website crashes it can be isolated and not crash the entire browser. This is a solution that IE8 also seems to be using.

The website rendering engine that Chrome is built on is WebKit – the same engine that Apple's Safari browser uses – and it should prove to be no more difficult than supporting Safari. The benefit of using WebKit is that it's the most innovative browser engine and focuses on the future of the web (such as providing a stable platform to run multiple dynamic applications). It supports CSS3 (and its own pretty amazing feature list) rather than purely serving up HTML websites.

The key point in Chrome-compatible websites right now is standards compliancy. Since Chrome doesn't have a big market share it won't be seen too often in sites' "supported browsers" lists. Yet since there's WebKit underneath Chrome it all boils down to the question: "Is your site valid enough for WebKit to render it properly?" If so then you're most likely in the clear.

For developers, one of the most important – and challenging – aspects of Chrome is its (still under construction) JavaScript V8 engine. The possibilities that arise from introducing a JavaScript Virtual Machine are fantastic, and the issues of working on a platform with limited resources are gone. Chrome's V8 brings about lightning-fast JavaScript execution and this is something worth looking into. Will V8 be the ultimate JavaScript Machine? Probably not, but it shows a clear direction that browsers are taking. For example, Mozilla has its own JavaScript engine, TraceMonkey, that in tests is even faster than V8. With Chrome's fast page rendering times and superior engine, developers can now offer more interactive and more feature-packed social sites and apps that can benefit users.

An additional benefit for brands, developers and users is that Google Gears comes pre-installed with Chrome as an 'out-of-box experience' of sorts. This is a big step; Gears was released about a year ago and wasn't widely adopted by developers outside of Google as the user had to install it, which is naturally a barrier for developers who may otherwise want to embrace the technology. It's a move that will push forward the development of applications that have the capability of working in both the offline and online world.

Chrome, in conjunction with Gears, will allow developers to create richer web apps using V8 without worrying about losing communications stability or playing and/or loading times. With Gears, we can create a different approach to apps that work both in offline and online modes, providing a more dynamic experience for the end user. This is an important development as it will allow developers to create truly rich internet apps (RIAs) that will work seamlessly with or without an internet connection, moving syncing to a lower layer, hidden from the user. Due to the Gears/Chrome integration, application developers will have more time to focus on the content in the app.

I believe that Gears, along with JavaScript V8 and the opportunity it offers both brands and users, has the potential to become a key selling point for Chrome. For developers such as myself, it's certainly an interesting space to be involved in.

Greg Wolejko is a front-end developer at software development consultancy Cognifide (www.cognifide.com). He specialises in creating high quality, standards-compliant HTML, CSS and JavaScript.

> "With V8 the issues of working on a platform with limited resources are gone" Greg Wolejko

/Ajax/build a site search system

Paul Hudson demystifies Ajax and shows you how to use it effectively to transform a site search system into a Scriptaculous one

Your essential CD
All the code from this tutorial can be found on the CD.

Knowledge needed PHP, MySQL

Requires PHP, MySQL, Scriptaculous

Project time 1 hour

Ajax is cool. It's true. But it's also misunderstood. People ask me to talk about Ajax a lot. How can I create an upload form in Ajax? How can I drag and drop list items in Ajax? How can I create Ajax navigation for my site? The answer to each of these questions is that you can't, or at least you shouldn't: Ajax is a very simple technology solving a very simple problem, but many people have decided that Ajax is some sort of web developer's magic wand that can solve all the problems we've had. If you want to create nice site navigation, use liquid layout and a healthy dollop of CSS. If you want to create an upload form, just use a plain old HTML form. And if you want to create drag-and-drop list items in Ajax, Ajax just doesn't come into the equation!

That said, there are times when Ajax can come in very useful; it's all about playing to its strengths. For example, your drag-and-drop script could use Ajax to transmit drop coordinates to the server. Similarly, you could create a very nice PHP site search system, but having a quick Ajax pop-up may prove much easier for your users. This latter system is what I want to show you in this tutorial: how to turn a site search system into an Ajax-powered quick searcher using Scriptaculous.

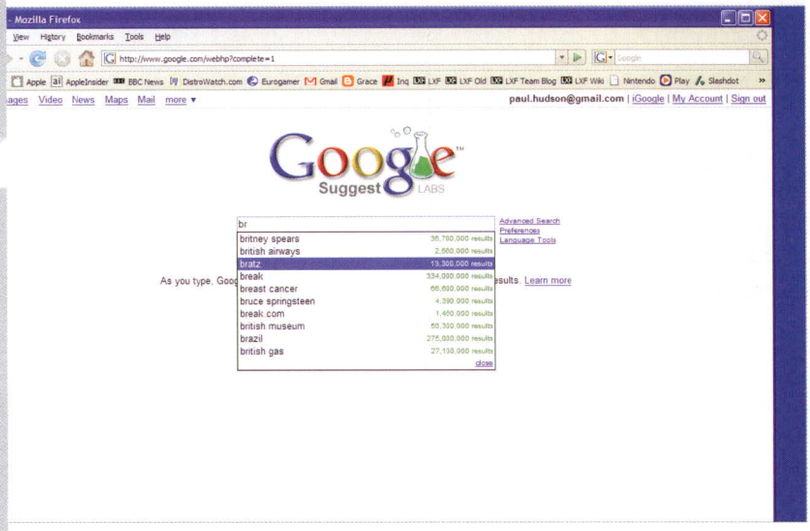
Scriptaculous love and hate

There are lots of things that Scriptaculous does well, but – as if the dark side of the Force were desperately trying to keep parity with the light side – there's just enough to hate and, as a result, many people feel reluctant to use it. Scriptaculous's biggest problem is its size and its lack of modularity. For example, it has all sorts of neat effects that you can apply to HTML elements to make them move around, disappear, fade and so on. It also has drag-and-drop functionality that turns any into a draggable element with one line of JavaScript. But because the developers want their draggable elements to fade slightly when they're being dragged, the drag-and-drop system automatically requires the effects code – all 37KB of it. The entire Scriptaculous system (which inevitably nearly all gets included) is 130KB before you apply JavaScript compression to it, and that's also before you include the 70KB of Prototype. Yes, this means that your visitors have to load at least 200KB of JavaScript before even getting around to loading the main chunk of your site.

On the plus side, some careful compression brings the whole package down to about a third of its size (if you're not already using it, try the free online compression tool at www.bananascript.com), and once you finally accept the big whack on your bandwidth usage, you'll find that Scriptaculous can do an awful lot for you.

Before looking at any Ajax or SQL, you need to put together a quick page that imports all the correct JavaScript libraries for your needs (you can plug the gaps later): you'll find this below. Notice the ordering of the script imports and the CSS styling. This will all be explained once the Ajax is in place.

```
<html>
<head>
<title>Home</title>
<script src="prototype.js"></script>
<script src="scriptaculous.js"></script>
<script src="effects.js"></script>
<style>
```



Web search Google uses an autocompletion system if you go to a special URL (www.google.com/webhp?complete=1). It shows you estimated results for each possible search

Expert tip Better MySQL text searching

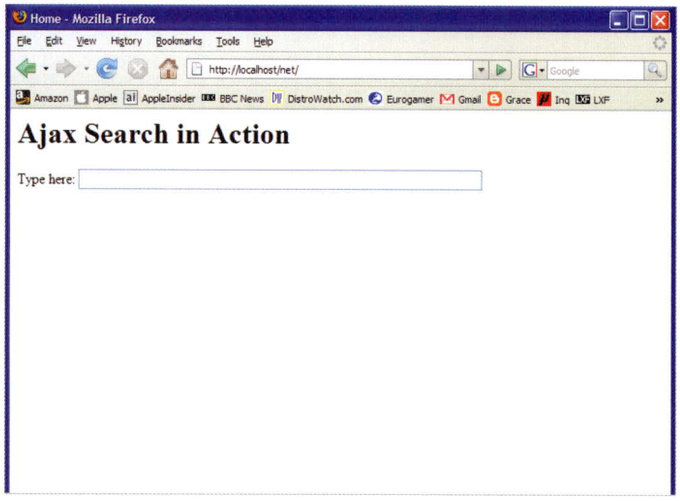
If you want to make your MySQL text searching smarter, use a fulltext index on the fields you're interested in. So, to add a **fulltext** index to the **Content** field in the **site_content** table, run this SQL command:

```
ALTER TABLE site_content ADD FULLTEXT(Content);
```

Fulltext indexes are fast, and they automatically ignore stop words ("a", "the", "and", etc) and words that are three characters or under. You also get more querying power – just using % signs isn't very good for advanced searches! Once you have a **fulltext** index, query it like this:

```
SELECT * FROM site_content WHERE MATCH(Content) AGAINST ('friend');
```

This will match all pages containing the word "friend". For advanced searches, you can use **Boolean mode**, which enables things such as **-friend** ("don't include friend"), **friend*** ("match variants, eg friends, friendly"), **my friend** ("only return pages that have the exact text 'my friend'"), and **friend >my** ("return all pages that contain 'friend', but consider them better matches if they also contain 'my'").



Simple needs Our web page only requires a text input box and a to hold results. Don't worry about trying to hide or position that – that's done by Scriptaculous

Make sure a search parameter has been provided and is safe to be put into a query

```
div.autocomplete { border: 1px solid #888888; margin: 0px; padding:0px; }
div.autocomplete ul { list-style-type:none; margin:0px; padding:0px;}
div.autocomplete ul li.selected { background-color: #b3d4ff;}
div.autocomplete ul li { list-style-type:none; display:block; margin:0;
padding:2px; cursor:pointer; }
</style>

</head>

<body>
<!– Nothing here yet! –>
</body>

</html>
```

Right, it's now time to turn our beady eyes onto SQL, which is of course a base requirement for any meaningful site search.

The back-end bit

A lot of people tend to think of SQL as difficult. They take one look at it and run for the hills, ignoring it completely and spending their time mucking around with divs and other prettiness instead! This is actually a real shame, and I recommend diving right in. If you spend the hour or two it takes to master SQL, it really will open up a brave new world. With complete control over your data, you can make it do all sorts of crazy things that you hadn't envisioned when originally designing the site. But this isn't an SQL tutorial, so for now I'm going to give you the least you need to know to make an Ajax site search work.

What you need to do here is make a table to store your site's content. You may already have something like this for your CMS. If not, use what I've provided here for now. Even if you do have your own thing, you'll need to at least look at the fields I'm using so that you can convert my PHP code to fit your needs. The base table should look like this:

```
CREATE TABLE site_content (
ID INT NOT NULL AUTO_INCREMENT PRIMARY KEY,
Title VARCHAR(255),
Content TEXT
);
```

Expert tip Customise your Scriptaculous calls

There are several different options you can put inside the braces to customise the way Scriptaculous handles your autocompleter, but the most commonly used one is to enable an indicator (sometimes called a spinner or, if you're a Mac user, a beach ball). These little "please wait" animations go almost hand in hand with Ajax sites, and are good to show users that something is happening while your code is waiting for the Ajax response. To use an indicator with Scriptaculous, put this **** tag near your search text box:

```
<span id="search_indicator" style="display: none"><img src="indicator.
                                                              gif"
alt="Please wait" /></span>
```

You can then modify your Autocompleter code to this:

```
<script>
new Ajax.Autocompleter("autocomplete", "autocomplete_choices",
"ajaxsearch.php", { paramName: "search",  indicator: "search_indicator"
                                                              });

</script>
```

Make sure you have some content in there, preferably with at least three entries that match a given word, so you can check that the search results look good in a list. Here are the entries I'm using:

```
INSERT INTO site_content (Title, Content) VALUES ('How to make friends', 'Blah
blah blah blah blah blah blah.');
INSERT INTO site_content (Title, Content) VALUES ('And influence people', 'Blah
blah blah blah blah blah blah.');
INSERT INTO site_content (Title, Content) VALUES ('The Big Friendly Giant', 'Blah
blah blah blah blah blah blah.');
INSERT INTO site_content (Title, Content) VALUES ('People Skills for Geeks',
'Blah blah blah blah blah blah blah.');
INSERT INTO site_content (Title, Content) VALUES ('Why Friends is a terrible
TV show', 'Blah blah blah blah blah blah blah.');
INSERT INTO site_content (Title, Content) VALUES ('Another test', 'Some
content here about friends.');
```

The word I'll be using for test searching is "friend" – it's there in plural ("friends") with a capital letter ("Friendly"), as well as in the page content rather than always just in the title. Go ahead and insert that into your database, or at least think about how your current database schema relates to the one above, because I want to move straight on to the code to perform a search on the server.

There are lots of ways to search a MySQL table for a string match, but for now I'm just going to use the most simple: a **LIKE** query. You need to connect to your server and select the database, make sure a search parameter has been provided and is safe to be put into a query, then run the query and return each result as an **<li>** list element. That last criteria is there because Scriptaculous's Ajax autocompleter expects each possible item as an <li> inside a parent <ul>. So, in PHP you need this:

```
<?php
  mysql_connect("localhost", "username", "password");
  mysql_select_db("database");

  if (!isset($_REQUEST["search"])) exit;
  $search = mysql_real_escape_string(trim($_REQUEST["search"]));

  $result = mysql_query("SELECT Title FROM site_content WHERE Title LIKE
'%$search%';");
  if (mysql_num_rows($result)) {
    echo "<ul>";
```

>>

Resources Find out more online

Scriptaculous wiki
The Scriptaculous wiki documents its controls thoroughly, but you'll need to do a lot of trial and error to see what works. If you're stuck, search for other people using the controls the way you want to and read through their code.
wiki.script.aculo.us

The Yahoo User Interface Library
Scriptaculous is just one set of Ajax controls. The Yahoo UI project has more functionality, and it has the added bonus that you can host the entire codebase from the Yahoo servers, saving you lots of bandwidth!
developer.yahoo.com/yui

```
>>    while ($r = mysql_fetch_assoc($result)) {
        $title = htmlspecialchars($r["Title"]);
      echo "<li>$title</li>";
    }

    echo "</ul>";
  }
?>
```

The important part there is the MySQL query, where % signs are used in a **LIKE** clause to mean "anything", so that **%friend%** matches "friend", "befriend", "friendly" and so forth.

Save this as 'ajaxsearch.php' in the same directory as your HTML page from before. With that part of the project done and dusted, there's just one job left to do: make the Ajax work.

Miraculous Scriptaculous

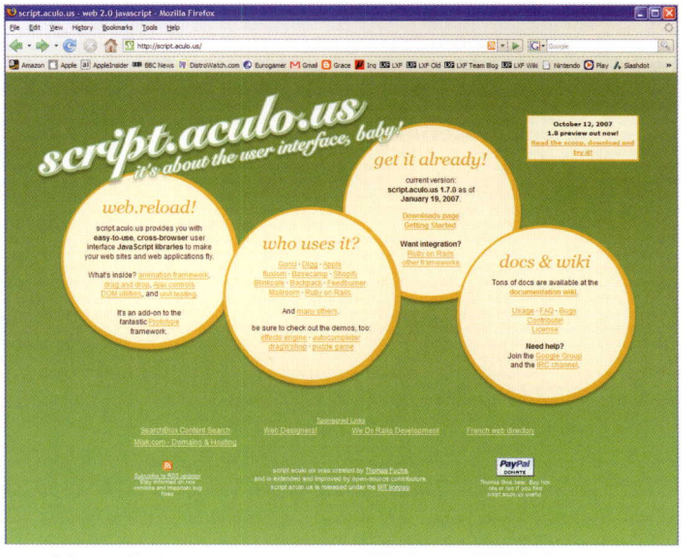
The main reason for Scriptaculous's popularity is that it's comically easy to use. Yes, this is a tutorial about Ajax, but ultimately Scriptaculous works as a black box. It could be using magic pixies to do its bidding for all we know, because it really does just work without any apparent hassle or complication. An Ajax site search system must work by sending data as we type it, then retrieving and displaying results in real time. Scriptaculous can do all this using an autocomplete system, similar to Google Suggest. As you type away into a text box it sends your text to the server, retrieves the results, then displays them clearly as a selectable drop-down box that users can click on or use their cursor keys. Couldn't be simpler.

All this functionality is cleverly encapsulated within Scriptaculous's **Ajax.Autocomplete** object which, quite frankly, is magic! You tell it the ID of your input field and the ID of a element where the results can be printed, and it does the rest. So:

```
<input type="text" id="autocomplete" name="autocomplete" size="100"
/><div id="autocomplete_choices" class="autocomplete"></div>

<script>
new Ajax.Autocompleter("autocomplete", "autocomplete_choices", "ajaxsearch.
php", { paramName: "search" });
</script>
```

The search system must send data as we type, then retrieve and display results in real time



Careful installation The Scriptaculous site always contains the latest downloads of the code, but note that the current Scriptaculous release works only with Prototype 1.5

All the real work takes place in the JavaScript line. It tells Scriptaculous to load 'ajaxsearch.php' (the MySQL search script from earlier in this tutorial) every time the user types a letter, and it sends the contents of the text box as the parameter **search**, as expected. In between the two braces (or the squiggly brackets, for the less technical), you can specify a number of other parameters to customise how it works – **minChars: 5**, for example, means that Scriptaculous won't send the search text to the server until at least five characters have been typed.

And that's all it takes – your code should now work. If you experience problems, try loading 'ajaxsearch.php' by itself, specifying a search parameter in the URL. If you don't see your returned results as neatly formatted s, then you quite clearly have a problem!

The final touches

The only thing that's really left to do is, surprisingly enough, work with the CSS, because that's where the biggest improvements can come from. Right now, you have code that sends some search text and retrieves results for display, and I've given you the code that prints those results out as a list which highlights as you move over things. It looks good, but with a little carefully written CSS, you can make it look even better, and it's very easy to make it fit into your website's theme. The key here is to make sure you're highly specific with your CSS rules. You'll notice that I've specified an <li> inside a <ul> inside a with the class **autocomplete**. This is very specific, because you need to make sure that Scriptaculous's styling doesn't clash with your own site's styling.

Another tip is if you switch to a more advanced search algorithm, you may want to change the **list-style-type** to something other than **none** to reflect the fact that you're ordering the results by match quality, rather than them just being alphabetical.

The point to note is that you can treat your results as any sort of list – there are no restrictions here, so let your mind wander. They don't have to be vertical, they don't have to have highlights when you hover over them (although this, plus the cursor, does make it clear that the result is clickable!), and they don't even have to pop up in such a plain way if you don't want that. Experiment with your site search and have fun trying out some of Scriptaculous's more advanced options. ●

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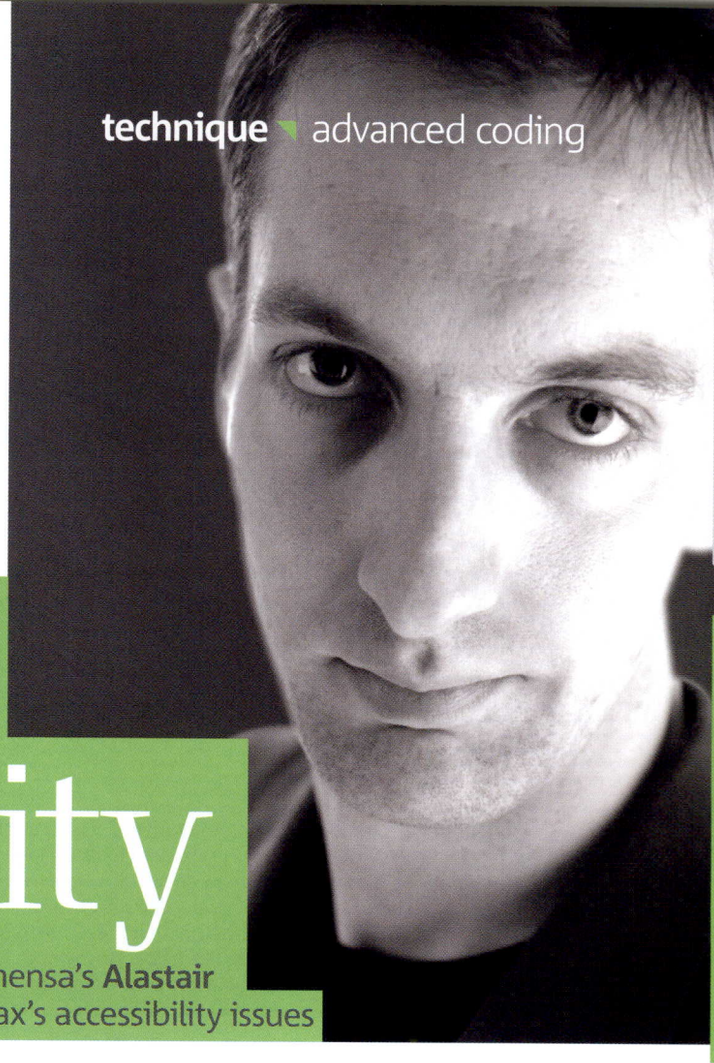
Published *PHP in a Nutshell, Fedora Core 5 Unleashed, Ubuntu Unleashed*
For Christmas, I'd like ... A PS3



Alastair Campbell on ...

Ajax and accessibility

PART ONE: In the first of a two-part opinion piece, Nomensa's **Alastair Campbell** explains what you can do to work around Ajax's accessibility issues

Developing a Rich Internet Application (RIA) that's accessible has historically been somewhere between difficult and a nightmare, even with seemingly common technologies such as HTML/CSS and JavaScript.

The issues with the accessibility of RIAs tend to revolve around Ajax. Sites such as kayak.co.uk and flickr.com use Ajax to update content without refreshing the page, but currently some users may not be able to use those controls or get at the new content. The issues with RIAs are not due to JavaScript as such, but more from trying to make up for deficiencies in HTML. With HTML's history as a document format, it doesn't intrinsically support many types of control. For example, you can visually indicate that a slider-control will affect the number of search results with CSS and JavaScript, but you can't indicate that non-visually.

Some access technologies and browsers are so poor at using scripts that JavaScript guru James Edwards said: "Stop using Ajax!" (tinyurl.com/5orymy). He demonstrated that many instances of Ajax were unnecessary, and that you can usually achieve the same thing without it. However, with a little thought, most issues can be worked around.

> "The safest approach is to use HTML controls as these are keyboard accessible" Alastair Campbell

This basic issue is not an accessibility one per-se, but some people (most often on corporate networks) don't have JavaScript enabled, or it may be filtered out on the way to the browser.

Defensive development

Jeremy Keith outlined Hijax (domscripting.com/blog/display/41) a couple of years ago, which is applying progressive enhancement to Ajax. While the concept of using <noscript> tags is outdated, building an application with semantic HTML and server-side scripting as a foundation is not. With a wide variety of browsers and situations, this type of defensive development is just good practice. Once the back-end functionality is in place, layering on the behaviour (front-end scripts) can greatly enhance pages without requiring JavaScript. With this in place, you can also provide a mechanism to turn off scripts where they're causing difficulties for people with partial JavaScript support.

Not all HTML elements can be focused on with the keyboard, so some scripted events won't be accessible if they rely on a mouse. At the moment the safest approach is to use standard HTML controls (links and form controls), as these are keyboard accessible by default.

When part of a page is updated, people using screen readers or magnifiers may not be aware something has changed. Often doing something on a page causes an update of another part of the page – for example, adding something to your basket on an ecommerce site. Yet people using screen readers or magnifiers will have no means of telling something has happened. It could end up being an expensive shopping experience!

There are often visual indicators of updates, such as the 'yellow fade' technique popularised by 37signals, but there's no indicator for someone on a screen reader. Even worse, some screen readers take a cached copy of the page, and the user can't get at the updated content. Thankfully, Gez Lemon and Steve Faulkner solved the caching problem with a function that updates the screen readers' cache after an update (tinyurl.com/yr5j6m).

Make sure someone using a screen reader knows if an update is tricky. Currently, you can only use content (including a hidden statement to refresh the page after making a change), or allow people to select an option where updates cause JavaScript pop-ups, or an option to turn off scripts.

For those using a screen magnifier it's good practice to make it apparent that something is happening where they clicked (an example is Basecamp's progress indicator), as their view follows the mouse closely.

There's a learning curve however the strategies and fallbacks are carried out. Ajax isn't going away, so we need to know how to make it accessible. On page 121 we'll look at a new spec that allows new controls to be added and people to be automatically informed about updates – ARIA. ●

Turn to page 121 for part two

/Ajax/ using drag and drop

One of the best tools in the Ajax developer's toolkit is item drag and drop. **Paul Hudson** explain how you can use it to make an online shopping cart

Your essential CD
All the code from this tutorial can be found on the CD.

Knowledge needed JavaScript, Ajax, PHP, MySQL

Requires Apache, PHP, MySQL, Scriptaculous

Project time 1 hour

Along with features such as right-click menus, menus and sliders, one of the best tools in an Ajax developer's toolkit is item drag and drop. Draggable items have been standard on computer desktops for two decades now, but have only recently come into their own online. Sure, they've been around, but they weren't really of much use until Ajax came along and made drag and drop work just like it does on the desktop – you can set up code to take certain actions when an item is dropped.

In this issue we're going to create a very basic shopping cart using drag and drop. Rather than code everything from scratch, we're going to be using Scriptaculous for the drag and drop JavaScript code, the **ajax.js** file I've given you before for sending and receiving Ajax data (it's on the disc again), plus PHP and MySQL for storing data.

This isn't going to be a full shopping cart solution: I've hard-coded it so there's only one 'order' and 'account' at any one time. You'll need to fill in those bits yourself!

What's in store

The first thing we're going to do is set up the database to hold the items that are for sale, plus the order information from customers. This isn't going to be complicated, so for items all we really need are the name of the item and the short name – that latter piece of information will be used to generate the HTML ID attributes for the items. In SQL, that gives us this:

```
CREATE TABLE items (
 ID INT NOT NULL AUTO_INCREMENT PRIMARY KEY,
 Name VARCHAR(255),
 ShortName VARCHAR(255)
);
```

You can then insert items one by one, like this:

```
INSERT INTO items (Name, ShortName) VALUES ('Linux Format #97', 'mag97');
```

Everyone's store is different, but mine will be selling magazines. Add as many items as you want now: you'll need at least six to give it all a good test later. Moving on, you'll also need to create two tables to store order information. One of them will track orders (who placed the order, when it was placed and so on), and the other will track individual items in each order (which item was ordered, how many were ordered, etc).

Because we're only creating a very basic system here, we're going to force the order ID #1 for all items, so we don't really need a table for orders. However, the table for order items should look like this:

```
CREATE TABLE order_items (
 ID INT NOT NULL AUTO_INCREMENT PRIMARY KEY,
 OrderID INT,
 Item INT,
 ItemCount INT
);
```

Leave that table empty for now – we'll be adding to it using the web page. Once it's built, that is!

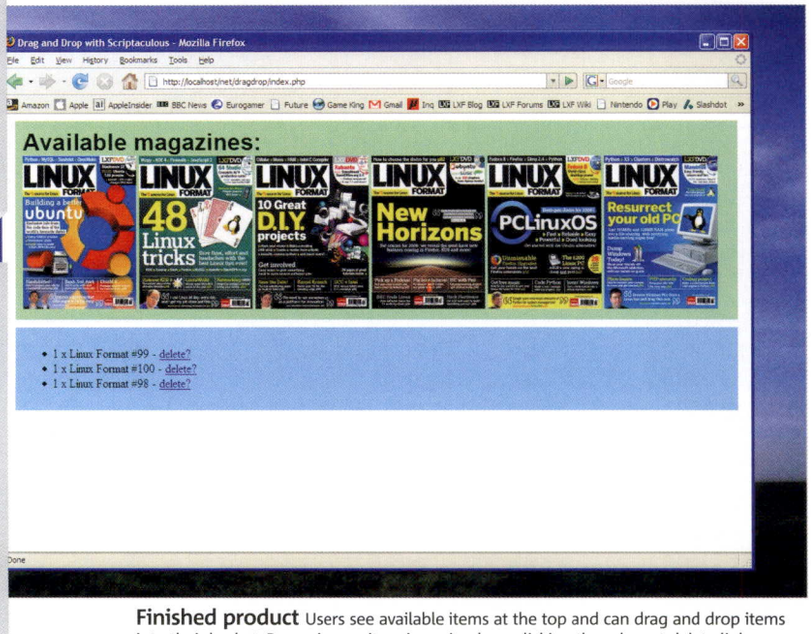
Come in, we're open

The main chunk of our HTML is split into two parts: an area to show what's on sale, and an area that will contain the visitor's basket. This will all be generated by PHP, and, as mentioned earlier, we need to use the **ShortName** field from the items table to fill in the ID number of the items that are for sale. This is so we can track which items are being added and removed based on their IDs.

So, the PHP code needs to: (1) pull out a list of all the ShortNames in the items table; (2) use that to print out pictures of the items with the correct ID attributes; and (3) create a ** ** area for the basket; again, this needs a meaningful ID so that it can be read from JavaScript easily.

Point (2) is easy to do because I've already created a **mags** directory where I've placed pictures of all the magazines I want to offer on sale. Each magazine uses its **ShortName** property + **.jpg**, so it's easy for PHP to output **<img>** tags for it. Here's the code:

```
<div id="available">
<h1>Available magazines:</h1>
<p>
```



Finished product Users see available items at the top and can drag and drop items into their basket. Removing an item is as simple as clicking the relevant delete link

What a drag Note that the magazine goes slightly transparent when dragged. A black border appears around the basket to show the item can be dropped

```
<?php
  $items = array();
  $result = mysql_query("SELECT ShortName FROM items;");
  while ($r = mysql_fetch_assoc($result)) {
    $mag = $r["ShortName"];
    $items[] = $mag;
    echo "<img id=\"$mag\" src=\"mags/$mag.jpg\" /> ";
  }
?>
</p>
</div>
<div id="basket">
<p>Your basket is empty.</p>
</div>
```

You'll need to prefix that with your own database connection code. Something like this ought to do the trick:

```
mysql_connect("localhost", "dotnet", "dotnet");
mysql_select_db("dotnet");
```

So, that makes everything *look* right, but nothing works. What happened to the drag and drop I promised? OK then ...

Life's a drag

Hopefully by now you've already installed all the software listed in the 'Requires' box at the start of this tutorial. What do you mean you didn't see such a thing? I don't know why we bother around here, I really don't. Alright, then, I'll make it easy for you: go and snag Scriptaculous and drop it into your working directory.

You'll also need the **ajax.js** file from your disc, as that contains the important two Ajax functions that send and receive data without me having to explain how it works every issue. Now add these lines in the **<head>** part of your HTML:

```
<script src="prototype.js"></script>
<script src="scriptaculous.js"></script>
<script src="effects.js"></script>
<script src="dragdrop.js"></script>
<script src="ajax.js"></script>
```

Now for the incredibly hard job of making each of those magazine items draggable. To make the one with the ID **mag98** draggable, you'd write this:

```
new Draggable('mag98', { revert: true } );
```

That **revert: true** part means: 'When I let go of the mouse, don't leave the item hanging around – move it back to where it came from.' Unless you're trying to create some sort of web-based Mr Potato Head game, chances are you won't want dragged items to remain where users left them, so keep revert on like this to make them snap back to where you want them to be.

Now, rather than make you type the above line once for each item in your shop, go back and reread the code from before that printed out all those items. Do you notice the sneaky little **$items[] = $mag;** line in there?

That's how we'll make this job even easier: that **$items** array will contain a list of all the ID attributes for the shop items, so to make them all draggable all you need is this:

```
<script>
<?php
  foreach($items as $item) {
    echo "  new Draggable('$item', { revert: true } );";
  }
?>
</script>
```

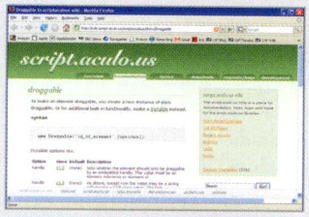
Put that just before **</body>** in your HTML. Your code now works: all the items are now draggable, and will move back to the **Available** items area when the mouse button is released. But there's still no Ajax around, so let me introduce you to the real magic of this project ...

A real basket case

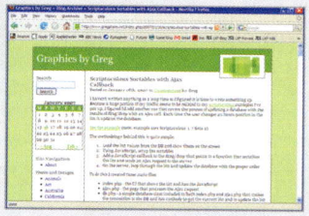
Create a new file called basket.php: this is going to be the back-end of our code and will receive requests to add and remove things from the

>>

Resources Find out more online



Scriptaculous wiki
The wiki contains reference documentation for all of its objects and effects, although the examples usually leave a lot to be desired and the 'demos' expect you to use Ruby on Rails. For reference purposes only.
http://wiki.script.aculo.us



Graphics by Greg
There are lots of great tutorials on making cool stuff with Scriptaculous, and most use PHP. To get started with sortable lists, I'd recommend this one.
www.gregphoto.net/index.php/2007/01/16/scriptaculous-sortables-with-ajax-callback/

Expert tip Adding some class

Part of the requirements for any serious Web 2.0 site is to have copious amounts of CSS, and the Scriptaculous developers have really gone to town with its use of CSS for various operations. You can see my own choice for CSS on your disc (hint: it's minimalist, just as I like it), but you may have wondered what the hoverclass text from the **Droppables.add()** call does. Well, all can now be revealed: if you set **hoverclass** to be the name of a CSS class, it will be added to the droppable area whenever a draggable item is moved over it with the mouse. To illustrate this, I've used the following CSS:

```
.basket_over { border: 3px solid black; }
```

So, when the mouse isn't over my box, it has its normal CSS theme. When the mouse is over the box, it has its normal CSS theme plus a three-pixel black border around its edges – a great way to show people that the box accepts items being dropped on it.

Expert tip Other Draggable options

The Draggable code this issue uses only one attribute of interest: revert. This causes the position of a Draggable object to revert back to its original values when the mouse button is released, which makes sense for shopping carts like this one. Another popular attribute for shopping carts is the ghosting attribute – if you set that to be true, the mouse only drags a copy of the object rather than the object itself, which creates a much more pleasing look. The Scriptaculous documentation has a full list of the options available to Draggable elements here: http://wiki.script.aculo.us/scriptaculous/show/Draggable.

Once you understand how the adding code works it's easy to make deleting code yourself

>> basket, as well as outputting the basket contents. You'll need to add your own database connection code to the top of the file, and you'll notice that I've forced both **$USERID** and **$ORDERID** to be 1 – you'll need to change that yourself if you want to make this into a fully fledged shopping basket. What this code needs to do is look through the list of all the items in the user's basket and print out an HTML list. This list will then get sent back to the client as HTML, and will be shown in the ** ** with the ID **basket**.

The SQL query required to pull out the short name, full name and item count all at once requires an SQL join. If that scares you, all you need to know is that it pulls information from two tables at once. Here's the code:

```
$USERID = 1;
$ORDERID = 1;
$result = mysql_query("SELECT oi.ItemCount, i.Name, i.ShortName FROM
            order_items oi, items i WHERE oi.OrderID = 1 AND i.ID = oi.Item;");

if (mysql_num_rows($result)) {
  echo "<ul>";
  while ($r = mysql_fetch_assoc($result)) {
    extract($r, EXTR_PREFIX_ALL, "item");
    echo "<li>$item_ItemCount x $item_Name - <a href=\"#\" onClick=\
   "SendAjax('basket.php?del=$item_ShortName', UpdateBasket);\" />delete?</
                                                                  a></li>";

  }
  echo "</ul>";
} else {
  echo "<p>Your basket is empty.</p>";
}
```

The really magic bit in there is in the **SendAjax()** call, and what it will do is send an Ajax request to **basket.php** (that's this page) and pass in the ID of the item to be deleted. The **UpdateBasket** part is a reference to a new function, and it will be called by **SendAjax()** when the Ajax response comes back.

I've already said that the ** ** named basket will automatically be filled with the output from **basket.php**, which should make the **UpdateBasket()** function rather easy to guess! Pop this inside your main HTML file, just under the other **<script>**s:

```
<script>
  function UpdateBasket(html) {
    var basket = document.getElementById('basket');
    basket.innerHTML = html;
  }
</script>
```

So, **UpdateBasket()** just looks for the basket element, then dumps a load of HTML in there. This makes sense, because **basket.php** sends back the basket data as HTML ready to be displayed, so all you need to do to make it show is drop it into an element like **UpdateBasket()** does.

There's one more part from this that's still missing: adding items must be done by dragging something from the **Available Items** list into the **Basket** box. To do that you need to register a droppable, which means an area that will spring to life when a draggable item lands on it. What we need our droppable to do is really the opposite of the **delete** link from **basket.php** – it needs to call **basket.php** again, this time with the ID of the item to add, then call **UpdateBasket()** when the Ajax response comes back, like this:

```
Droppables.add('basket', { hoverclass: 'basket_over', onDrop: function (el) {
SendAjax('basket.php?add=' + el.id, UpdateBasket); } } );
```

Put that at the end of the last **<script>** element in your HTML page, and you now have an area where things can be dropped.

Adding and removing

Of course, there's one obvious thing still missing: things can be dragged, they can be dropped and the visitor's basket is displayed nicely. But there isn't actually any way to add or remove items from the basket, because **basket.php** is being called with **add** or **del** set, but it doesn't do anything with those two parameters. For example, when adding an item, **basket.php** needs to:

- Escape the string, so that it's safe for database queries
- Check whether the item exists
- If it does, add one to the current number in the basket

The third point can be accomplished in two ways. First, you could search for the item and, if it exists, add one to it. Alternatively, you could try adding one to the item whether or not it exists, and, if it doesn't, add it. I've chosen the second route, because it requires less code (rather than **SELECT**, then **UPDATE** or **INSERT**, it just requires **UPDATE** and **INSERT**). Yes, this is very lazy. Putting the above three points into PHP, you get this:

```
if (isset($_GET["add"])) {
  $add = mysql_real_escape_string(trim($_GET["add"]));
  $result = mysql_query("SELECT ID FROM items WHERE ShortName =
                                                          '$add';");

  if (mysql_num_rows($result)) {
    extract(mysql_fetch_assoc($result), EXTR_PREFIX_ALL, "item");
    mysql_query("UPDATE order_items SET ItemCount = ItemCount + 1 WHERE
OrderID = $ORDERID AND Item = $item_ID;");
    if (!mysql_affected_rows()) {
      mysql_query("INSERT INTO order_items (OrderID, Item, ItemCount)
                                          VALUES ($ORDERID, $item_ID, 1);");

    }
  }
}
```

The key line there is the one with **mysql_affected_rows()**, because if the **UPDATE** code didn't manage to add one to the number of items in the user's basket it means we need to **INSERT** a new item by hand. Like I said, lazy.

You now have nearly all the code to make your shopping basket work. In fact, you can go and try it now, although you'll only be able to add items! That's OK, though – once you understand how the adding code works it should be easy for you to make the deleting code yourself, or if you demand maximum value for your money and minimum effort (I wouldn't blame you) you can just snag my own code from the disc. ●

About the author

Name Paul Hudson
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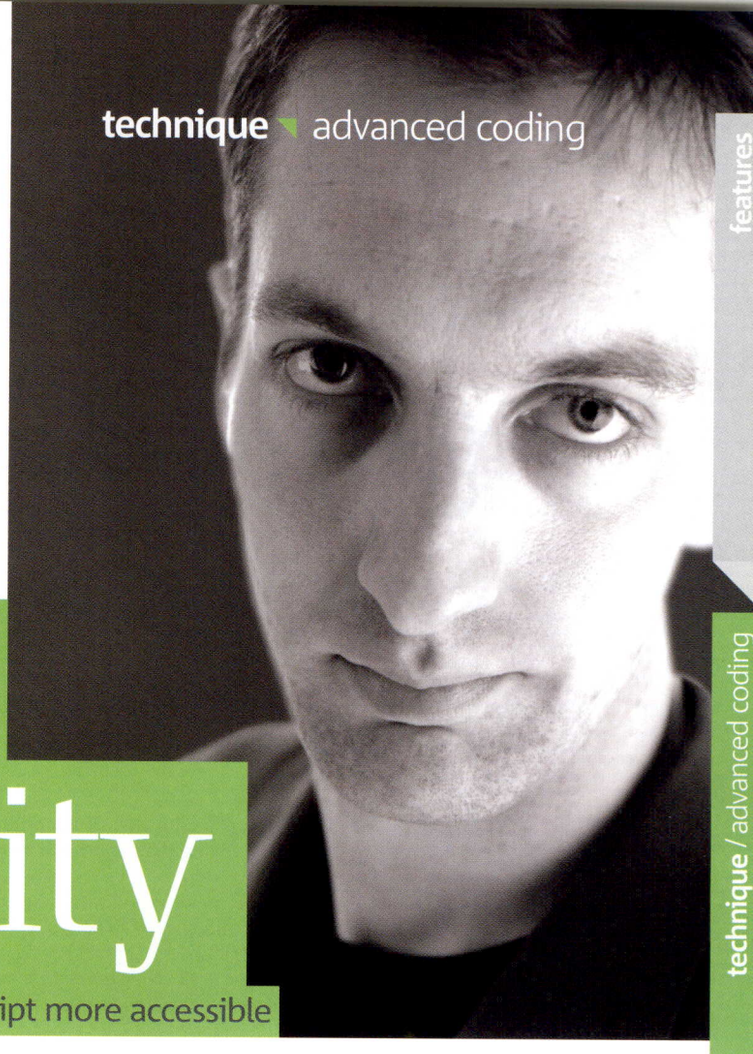
Areas of expertise PHP, MySQL, Linux
Published *PHP in a Nutshell*, *Fedora Core 5 Unleashed*, *Ubuntu Unleashed*
Best biscuit Viscount. I enjoy pronouncing them Viss-count.



Alastair Campbell on...

Ajax and accessibility

PART TWO: In the second of a two-part opinion piece, **Alastair Campbell** explains how ARIA can make JavaScript more accessible

On page 117, we saw how JavaScript, and specifically Ajax, could create problems for access technologies such as screen readers and magnifiers. Some of the new controls and updates to the page cause issues that are hard to work around, but there is a new hope.

A spec from the Web Accessibility Initiative improves the situation. It's called ARIA (Accessible Rich Internet Applications) and it provides ways to make the new fangled JavaScript and Ajax widgets work with access technologies (www.w3.org/WAI/intro/aria.php). Support has grown quickly, with all the main browsers and many screen readers starting to use it. It works by simply adding attributes to HTML elements. For example, you could define a 'tree' menu with:

```
<ul role="tree" tabindex="0" >
  <li role="treeitem">First item</li>
[...]
</ul>
```

> "With ARIA, updates to content can be announced through the live attribute" Alastair Campbell

The **role** defines what type of control it is, the **tabindex** is used to allow keyboard navigation. Roles defined in the spec should cover most situations, such as menu, toolbar, slider, tooltip and tree. You can also define your own.

With ARIA you don't use the **tabindex** attribute to define the tab order, but to add or remove things from it. An unordered list cannot normally be focused on when using a keyboard, but adding **tabindex="0"** will mean that you can, and in the normal order. Using a value of -1 (or less) will enable you to remove things from the tab order, and this can be done dynamically with JavaScript.

You can also say when something has a **state**, such as **checked**, **expanded** and **selected**. For things that are not links or traditional form controls, this will be vital to match the visual representation. Current methods for making sure someone using a screen reader knows of an update are tricky, but with ARIA, updates to the content can also be announced through the **live** attribute. This can be **off**, **polite**, **assertive** or **rude**. For example, this HTML section's updates will be announced:

```
<div id="myLiveRegion1" aria-live="assertive">
[updating content]
</div>
```

At the moment adding ARIA attributes does make your HTML invalid. Given ARIA is only applicable where you're using JavaScript functionality, it makes sense to apply the attributes via the scripting.

Yahoo took just this approach when applying ARIA attributes to its menu control (yuiblog.com/blog/2007/12/21/menu-waiaria/), where it mapped the current class names to roles and states. Yahoo also cleverly manipulated the **tabindex** to remove hidden options until they're visible.

Creating advanced functionality with JavaScript tends to require a library, which brings advantages when including accessibility. Yahoo and Dojo have both announced they'll build support into their JavaScript frameworks, and jQuery has an extension that enables you to easily add ARIA attributes. Google has also entered the fray, with its AxsJAX JavaScript framework for adding ARIA-based enhancements to existing applications. With the Firevox extension for Firefox you can test ARIA-enabled sites right now.

These implementations won't do everything for you, but they enable you to add functions that support ARIA. The Yahoo menu example uses this to add the ARIA state to its drop-down:

```
oMenuItemLabel.setAttribute("aria-haspopup",
true);
```

So when the item is selected and the drop-down appears, assistive technologies know what they should do with it. The Dojo framework has announced it will be making its default widgets use ARIA out of the box.

These features are ready to try right now. Just download the Firevox (reader) extension to Firefox (www.firevox.clcworld.net/). ●

Alastair Campbell is director of user experience at Nomensa (www.nomensa.com).

/Ajax/code a customer rating system

Boost sales from your online shop by letting customers submit ratings, then using them to create targeted product suggestions. **Paul Hudson** explains how

Your essential CD
All the code from this tutorial can be found on the CD.

Knowledge needed PHP, MySQL, JavaScript

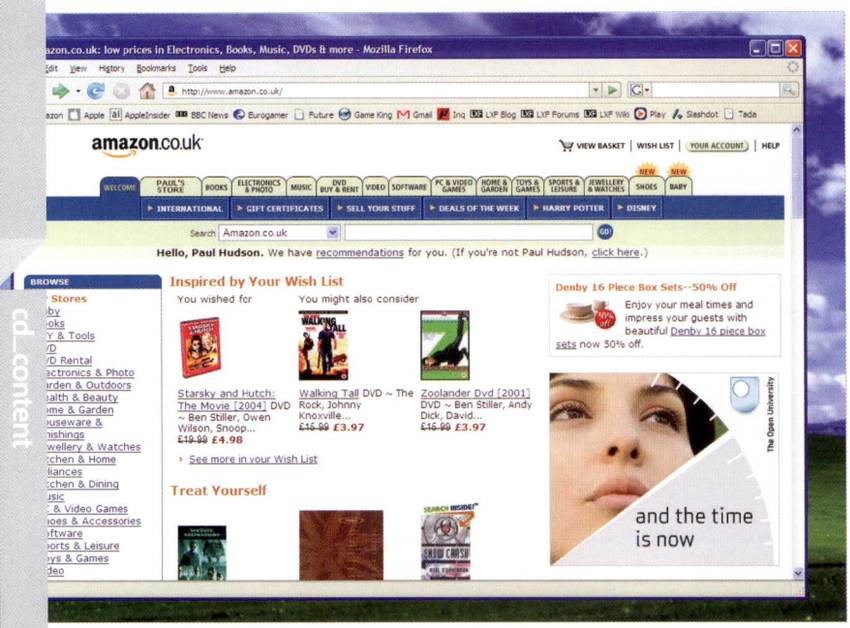
Requires PHP, MySQL

Project time 1 hour

So there's a consumer who's looking for a particular product. If you can get them to visit your online shop and buy it there, then you've hit paydirt. Right?

Well, up to a point. But in fact the real money – and what really does take some work – is in convincing them to buy other things while they're there. Smaller things. Things they might not have heard of. Things they might not have even realised they wanted until you flagged them up for them. This is something Amazon's astonishingly good at. It takes books and other items that are way out on the edge of the sales tail and says: "People with similar wish lists to you also liked ... " And it's not just the contents of your wish lists. Items you've bought, items you've viewed, items you've rated, things you've searched for and more – all these are brought together to entice you to buy more products.

Given Amazon's stranglehold over online commerce, it's clear that its approach works. Josh Petersen, an ex-Amazon employee, once described the business's approach to Long Tail economics as, "We sold more books today that didn't sell at all yesterday than we sold today of all the books that did sell yesterday." In other words, if you add up all the book sales from Monday, then add up all the book sales from Tuesday while only counting books that didn't sell at all on Monday, you'll find the second figure is larger than the first. That's Long Tail economics in action, and that's what Amazon does better than any other e-retailer out there.



Mail order The king of massive catalogues and of making those catalogues work hard, Amazon's also one of the best-known retailers on the web. Who'd have thunk it?

Here, we're going to create an online rating system so that visitors to your site can provide feedback on what they like. This will be compared to a list of existing ratings from other users, then juggled around to provide a list of other products that might interest the viewer, based on their ratings.

To make the whole site sit together nicely, I'll be using Ajax to keep the user experience speedy and clean. I'm going to assume that you already have a product catalogue up and running; the one I've used is deliberately simple because it's not terribly important. You can find the SQL on your disc, ready to adapt to your own needs.

Sending ratings

There are two parts to this particular problem: storing ratings for items and generating suggestions for other items based on those ratings. The second part is clearly dependent on the first, so to start this tutorial I want to look at how to store ratings.

To accomplish this task, you need three tables in your database: users, items and user ratings. I've included a very simple SQL task on your disc to set up these tables but, in brief, all my code does is associate an ID with a name for both users and items, then ties the user ID and item ID together, along with a rating in a third table.

I've also provided you with some sample data to populate each of the tables, but really the whole usefulness of your recommendation system only grows when more people recommend products.

On the copy of my code on your disc, you'll see three PHP scripts: one for showing all items that are for sale, one that's a detail view for each item (although admittedly my simplified tables mean there isn't much detail) and one for back-end handling of our Ajax rating system.

Most of it is nothing special, but there are two things that I want to demonstrate. First: how to show previous customer reviews. Lots of customers review products (at least, that's what happens if your site is popular), and you'll need a quick way to show exactly how highly rated each product is.

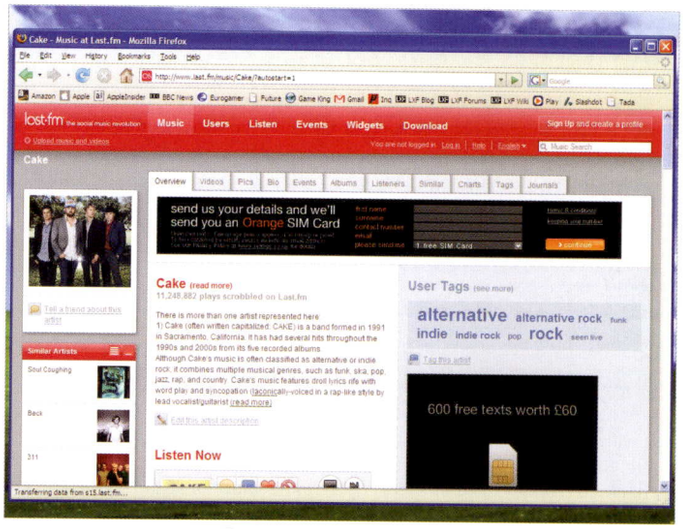
The fastest way to do that is using MySQL's built-in **AVG()** function, which calculates the average value for a column. For example, if we assume you have an item's ID number as the PHP variable **$IID**, you could use this line of SQL to find out the average customer rating for that item:

```
SELECT AVG(Rating) AS Rating FROM shop_ratings WHERE ItemID = '$IID';
```

The second thing I want to mention is how Ajax calls are performed. I've gone over quite a few Ajax-related topics in recent issues of .net, and each time I've used an Ajax script called **ajax.js** that does all the call and response handling automatically.

This example is no different, so you'll find **ajax.js** on your disc ready to use. But if this is your first time working with Ajax, let me quickly show you how it works here:

1) Import the **ajax.js** file so that it's ready to use. You need to do this before you make any Ajax calls.



Pick of the pops Last.fm uses votes from listeners to figure out what's hot in the music world and, importantly, which songs you're most likely to enjoy from other artists

2) When the **Rate** button for an item is clicked, it will call **SubmitRating()**.
3) The **SubmitRating()** function will look up the value of a **<select>** HTML element on the page and send it to **SendAjax()**, along with the URL to load (**rating.php**) and the ID of the element being rated.
4) **SendAjax()** takes the name of a callback method as its second parameter. That is, you can specify the function that should be called when a value is received back from the server.
5) In this example, I'm going to pass **UpdateSuggestions()** as the second parameter to **SendAjax()**, which I'll use later to print out suggestions for other customer purchases.

Converting all that to JavaScript gives this:

```
<script src="ajax.js"></script>
<script>
function SubmitRating() {
  var Rating = document.getElementById('Rating');
  SendAjax('rating.php?Item=<?php echo $IID; ?>&Rating=' + Rating.value,
UpdateSuggestions);
}
function UpdateSuggestions(results) {
  var RateItem = document.getElementById('RateItem');
  RateItem.style.display = 'none';
}
</script>
```

Along with a little sprinkling of HTML to create the form and show the item being viewed by the user (again, this is nothing special), that's the front-end of the ratings done.

Ratings war

What happens when someone tries to rate something more than once? And what happens if someone monkeys with your HTML, using Greasemonkey or something like it, and tries to rate an item 6/5?

These are the kinds of problems you need to be solving on the server side of this ratings system, so you can either close the mag and spend a few hours figuring it out yourself, or you can read how to do it here and now, then spend your time programming something a bit more glamorous instead – I hear the iPhone SDK is quite nice ... Anyway, **rating.php** gets called by our Ajax script when the user submits a rating. It needs to connect to the database, check it has all the right input required to add a rating (and that it's valid data), check whether a rating has been submitted by this user for this product already, and if so update the existing rating rather than adding a new one.

Ensuring that valid item IDs and ratings are provided is very easy, thanks to calls to **mysql_real_escape_string()** and **trim()**, but for a little extra security – and so I can safely bounds-check **$Rating** – I typecast both of these inputs to integers, forcing them to be **0** if they aren't a valid number. Here's the PHP:

Expert tip Adding an index

The larger your data set gets for product ratings on your site, the more useful it becomes – and the slower it becomes to search. Most of the weight of our queries is based around the item ID, so if you want to score a big boost in performance you should also add an index to your ratings table, based on the item ID key.

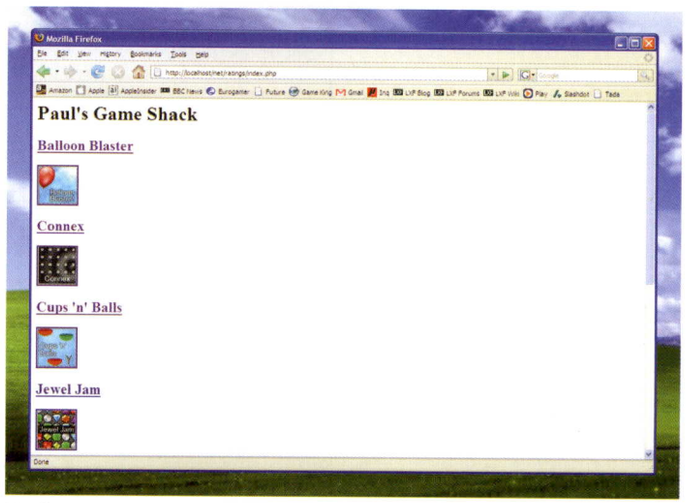
Given Amazon's stranglehold over online commerce, it's clear that its approach works

```
<?php
  mysql_connect("localhost", "dotnet", "dotnet");
  mysql_select_db("dotnet");
  $USERID = 1;
  if (!isset($_REQUEST["Item"])) exit;
  if (!isset($_REQUEST["Rating"])) exit;
  $IID = (int)trim(mysql_real_escape_string($_REQUEST["Item"]));
  $Rating = (int)trim(mysql_real_escape_string($_REQUEST["Rating"]));
  if ($Rating < 1 || $Rating > 5) {
    echo "Bad rating: $Rating";
    exit;
  }
  $result = mysql_query("UPDATE shop_ratings SET Rating = '$Rating' WHERE
ItemID = '$IID' AND UserID = '$USERID';");
  if (mysql_affected_rows() != 0) {
    // changed!
  } else {
    // not found
  mysql_query("INSERT INTO shop_ratings (ItemID, UserID, Rating)
VALUES
('$IID', $USERID, '$Rating');");
  }
?>
```

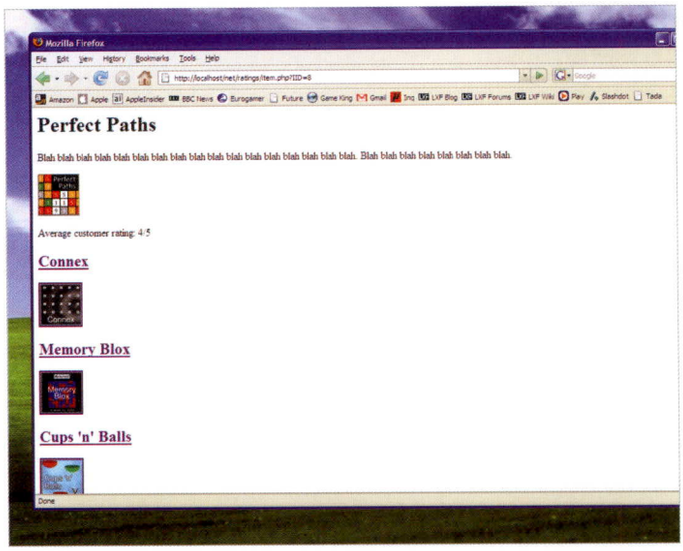
Suits you, sir

The final part of this project is to implement some sort of recommendation system so that we can entice buyers to part with more of their cash.

There are lots of ways you could do this – and indeed the more you have, the more chances you have of making sales – but the option we're going with in this issue is to look for all other buyers who've rated a >>



Up front The store front in our example has been kept simple, with things for sale, pictures and a link to more information. You'll probably want to order yours by rating



Popular vote When users click on an item, they get to see how it's been rated and submit their own vote. They'll also be shown other products that might interest them

particular item, then look for all other items they've rated, reverse sort the average ratings (highest first), then print out the top five. That can all – rather magically – be done in a single SQL statement, thanks to subselects:

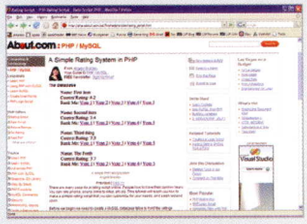
```
$result = mysql_query("SELECT ItemID, AVG(Rating) AS AvgRating FROM
shop_ratings WHERE UserID IN (SELECT UserID FROM shop_ratings
WHERE ItemID = $IID) GROUP BY ItemID ORDER BY AvgRating DESC
LIMIT 5;");
```

Like I said, it's magic, but it works and that's what matters.

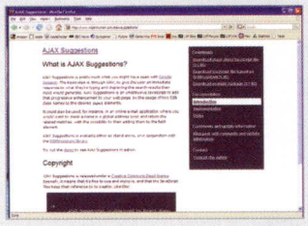
Once that's done, you just need to loop over the rows in that result, snagging the names of each item as you go, so that it can all be printed out as the return value from **SendAjax()**, like this:

```
if (mysql_num_rows($result)) {
  while ($row = mysql_fetch_assoc($result)) {
    $item_ID = $row["ItemID"];
    $subresult = mysql_query("SELECT Name FROM shop_items WHERE ID =
$item_ID;");
    $subrow = mysql_fetch_assoc($subresult);
    $item_Name = $subrow["Name"];
```

Resources Find out more online



Simple Rating System in PHP
There are lots of different ways to implement a ratings system. If you'd like to try an easier solution, or don't like buzzwords such as 'Ajax', About.com has the perfect project for you. Find it at the following address: php.about.com/od/finishedphp1/ss/rating_script.htm



Ajax Suggestions
Why wait for users to submit ratings in order to suggest more things to buy? There are several good Ajax suggestion scripts out there that can dynamically pull suggestions from your server – why not give this one a try? www.robertnyman.com/ajax-suggestions

Expert tip Updating ratings

In my example, buying information is sent back by the server as part of the Ajax call, but the new item rating itself isn't updated with the user's rating. This isn't too hard to fix – just reshuffle the HTML layout so that the average rating is inside the user's rating box, and it can be replaced when the return value comes back from the server.

```
    echo "<a href=\"item.php?IID=$item_ID\">";
    echo "<h2>$item_Name</h2>";
    echo "<img src=\"images/$item_ID.png\" />";
    echo "</a>";
  }
}
```

And with that we've come full circle: the JavaScript **SendAjax()** function sends a vote, the server sends back a response, including buying suggestions, and it's down to the JavaScript to choose what to do with that response. The simplest option is best for now: hide the rating box, then drop in the complete HTML output direct to the screen.

If you want to do something fancier, go for it; otherwise, here's the code:

```
function UpdateSuggestions(results) {
  var RateItem = document.getElementById('RateItem');
  RateItem.style.display = 'none';
  var Suggestions = document.getElementById('Suggestions');
  Suggestions.innerHTML = results;
}
```

It's as easy as that. See the image above-left for an example of what your online store might look like.

Where next?

What we've built in this tutorial is a quick and simple voting system. It's just like any other site poll, except that it applies individually to all products rather than to a set question. The real value of these voting systems lies in precisely what you choose to do with the collected data, and that's where this project is pleasingly cyclical. The more people who use it (by submitting their ratings), the better it gets (in this instance, the more accurately it guesses what you might like to purchase).

But there's still more that you can do to make the system smarter and extend it to other parts of your site.

For example, right now we assume that everyone who says they liked a particular item should see a list of buying suggestions based on people who liked the same item. Fair enough. But what if someone says they didn't like a product? What you choose to do in this situation is down to you – do you reverse the query and search for "people who hated this also hated"? Or, perhaps more usefully: "People who hated this liked these other products instead ... "

You might also want to have your site track which items a user visits, then factor that into their recommendations. This can be done either as "people who looked at this item also looked at ... " or, simply, "items you looked at recently".

Either way, the point is to make visitors get more from your site, so that your sales catalogue starts working for your benefit – and for the benefit of your customers.

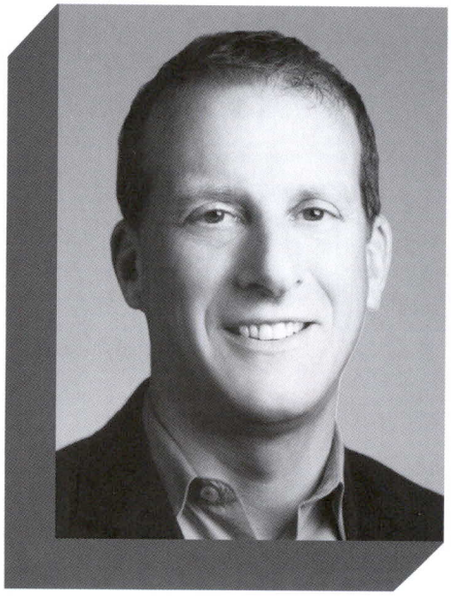
If you'd like more ideas for where to take your voting system, have a look at the resources on the left, where you'll find examples of other possible implementations in both PHP and Ajax. ●

About the author

Name Paul Hudson
Site www.hudzilla.org
Areas of expertise PHP, MySQL, Linux
Published *PHP in a Nutshell, Fedora 5 Unleashed* and more
What was your favourite school subject? How To Get Home Without Getting Your Head Kicked In – ah, Sunderland ...

Rich Miner code.google.com/android

Google took a big step into the world of mobile with the launch of the G1. Rich Miner, co-founder of Android, talks to **Oliver Lindberg** about the future of the search giant's portable platform



Rich Miner

Job Co-founder of Android and group manger for Mobile Platforms at Google

Age 44

Education PhD in computer science from the University of Massachusetts

Web career Vice president of advanced services at Orange, co-founder and CTO at Wildfire

.net: G1 was the first Android device. Will there be many more?

RM: There are going to be many others. We're working with companies like HTC, Motorola, Samsung and LG, and I'm pretty convinced we'll start to see other devices with other carriers. Also, we've got a very vibrant third-party development community that's building apps even I couldn't imagine. So you'll start to see lots of great apps.

.net: The G1 is no doubt a great phone but it hasn't got the wow factor of the iPhone. How important are the looks for Google?

RM: We're pretty happy with the design of this first device. Especially when you hold it and slide up the keyboard. You're converting between a profile touch and a landscape QWERTY mode – it's a very nice experience. It's the overall experience that is important as well as the design.

.net: Are you planning to include corporate email and video recording in the next version?

RM: Whenever you have a first product out, you get what you can get into that first release. Google is pretty much a consumer company, so for the most part our focus is on consumer features. Certainly video recording and playback will be there at some point. As far as the enterprise applications go, we're working with lots of partners. I'm sure you'll see VPN capability, Exchange and other capabilities quite soon.

.net: Is a £50 mobile with Android a possibility?

RM: You will see Android move down market. That hasn't been our focus and that's probably not the current focus of most of the firms now building phones based on Android. Our initial phones are high-end smartphones with Wi-Fi and GPS and accelerometer, large screen and touch screen and a sliding keyboard, but the requirements for Android do enable it to move onto lower cost hardware.

.net: What are your plans for Android?

RM: There's no direct business model tied to Android. Our mission at Google is to organise the world's information and make it universally useful and accessible. There are about 200million PCs sold every year and about one billion mobile phones sold every year, so it's important to have very powerful mobile devices that provide a great connected data experience. Preferably these should not controlled by any one entity, so the real goal with Android and the open sourcing is to make sure there's a very powerful and open platform that's available for people to innovate on top of. That's our long-term goal.

Ultimately, we'll do more advertising in mobile but at the moment that's not our short-term focus. When we do advertising, we always want to make sure that it can benefit the user, and today it's very hard to do that on these small devices. So we've still got work to do.

.net: How do you expect developers to respond?

RM: We want to be very developer friendly. The mobile space up to now has been kind of hostile to developers. You had a very complicated app signing process that required signing with many different parties, carriers or other entities. Even for a large company like us, it's a very complex and costly process to get our apps onto lots of devices. Now for the first time developers can start to feel that their success is in their own hands, not in their hands of the carrier or some third party. If they build a great app, consumers will be able to find it and if people like it and rate it highly, that app can be successful based on their own technical achievements, their own marketing spin and their own viral communication.

.net: Why did you decide to enter this market?

RM: Google was founded on very strong open source tools that enabled us to build the first Google servers, the first search engines, the whole platform and all of our services. When we started building mobile apps, our founders and a lot of the engineers were surprised by how complicated the development environments were. And we just thought that the entire industry would benefit if there was a very powerful, open platform that enabled innovation and that wasn't controlled by any one entity.

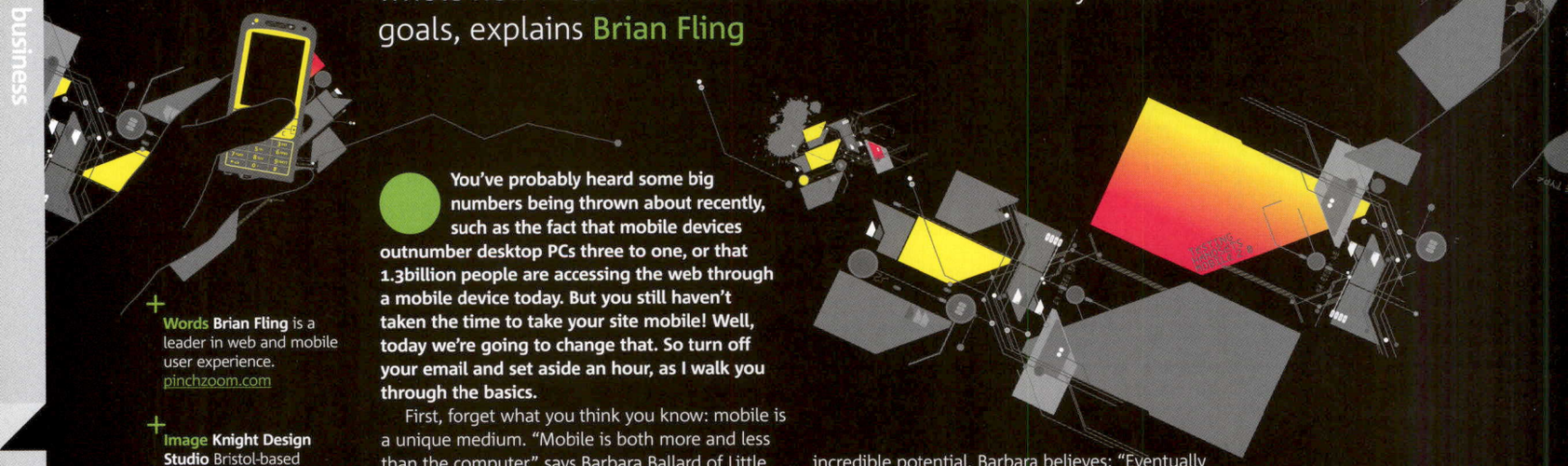
It's true – our apps can make their way onto these other phones but often, let's face it, it's a bad user experience. They're not very good with data services. Their user interfaces aren't that good. We've spent hundreds of millions of US dollars to build this platform to make a mobile industry a better place for developers, including Google.

> "For the first time developers can feel that their success is in their own hands" Rich Miner

*Convert your site to mobile

Your essential CD
All the code samples from this feature can be found on the CD.

Adapting your website for use on portable devices isn't just about resizing it. Making the most of mobile means getting to grips with a whole new medium and an audience with radically different goals, explains Brian Fling



+ **Words Brian Fling** is a leader in web and mobile user experience. pinchzoom.com

+ **Image Knight Design Studio** Bristol-based graphic design agency.

You've probably heard some big numbers being thrown about recently, such as the fact that mobile devices outnumber desktop PCs three to one, or that 1.3billion people are accessing the web through a mobile device today. But you still haven't taken the time to take your site mobile! Well, today we're going to change that. So turn off your email and set aside an hour, as I walk you through the basics.

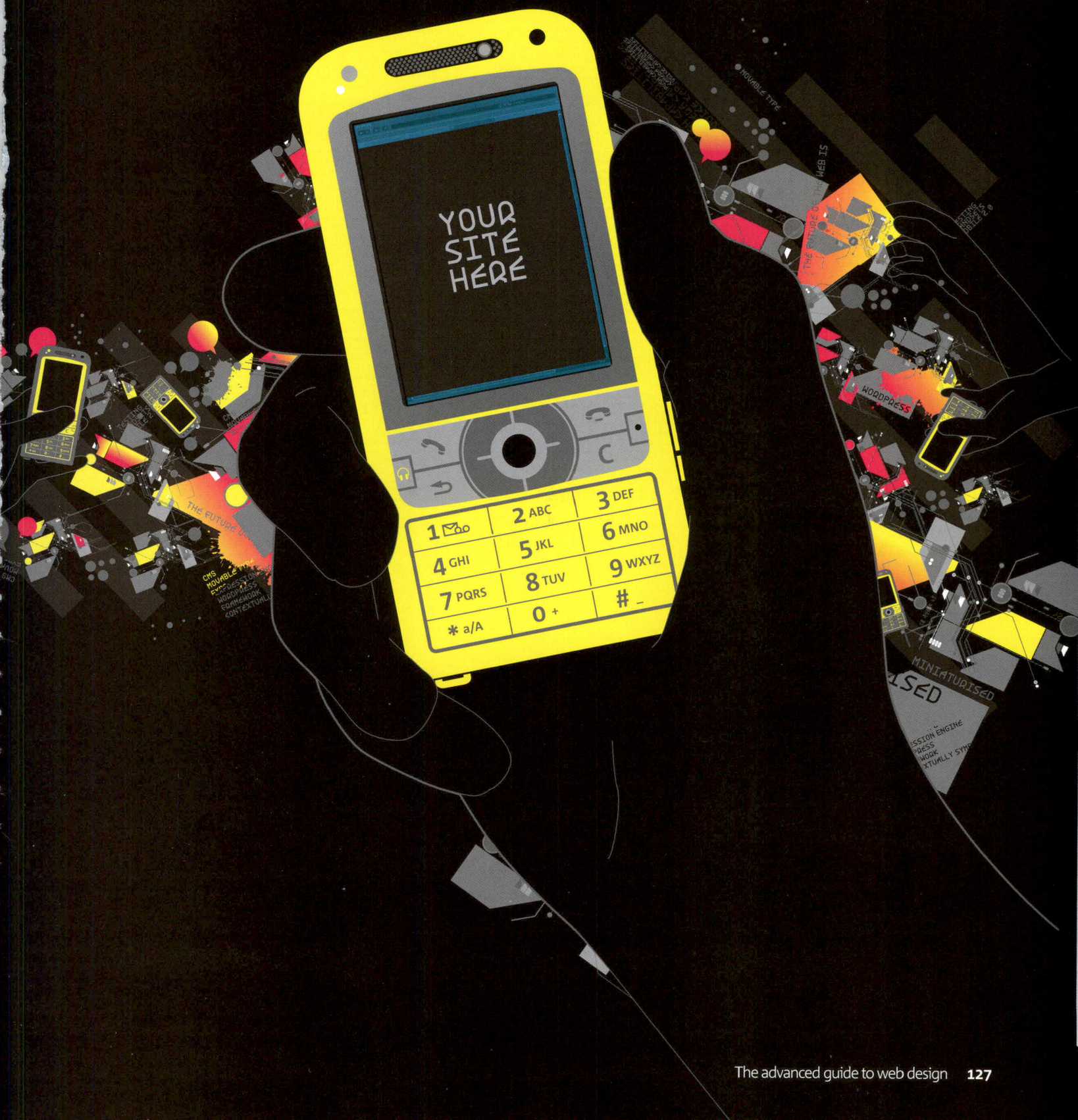
First, forget what you think you know: mobile is a unique medium. "Mobile is both more and less than the computer," says Barbara Ballard of Little Springs Design (littlespringsdesign.com). "The 'less' is obvious: smaller screen, limited text input, slower connection, limited battery life. But the 'more' is just as important: always connected, push capabilities, camera capabilities, voice capabilities." The unique benefits of the mobile medium have incredible potential, Barbara believes: "Eventually it will be a remote control for your life."

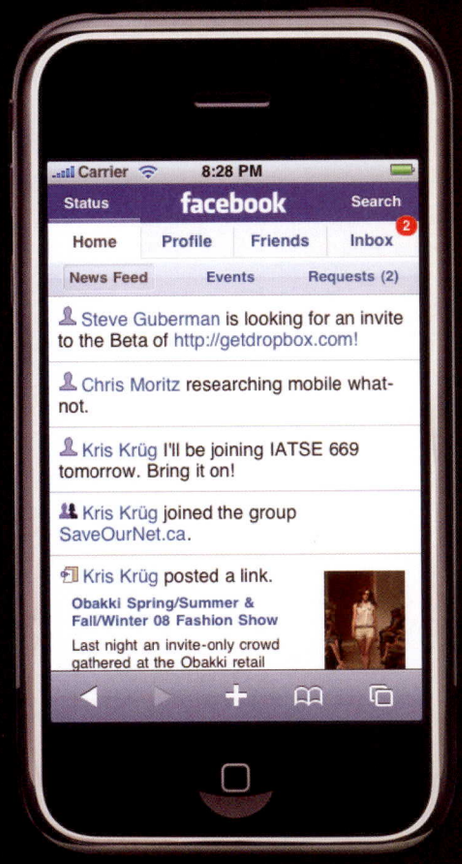
The unique benefits of the mobile medium have incredible potential

So the first step to taking your site mobile is to put aside all of your notions about what the mobile web is or isn't. It would be easy to think of your mobile website as a miniaturised version of its desktop cousin, but this would be a mistake.

The mobile web is growing up quickly and it can be hard to keep up. Plus the web community likes to talk about what the mobile web should or shouldn't be without really understanding how the medium works.

Your best bet for taking your site mobile is to forget what you think you know and just do it. Like most things worth trying, getting to >>


YOUR SITE HERE
1
2 ABC
3 DEF
4 GHI
5 JKL
6 MNO
7 PQRS
8 TUV
9 WXYZ
* a/A
0 +
_
C
MOVABLE TYPE
WEB 2.0
WORDPRESS
MINIATURISED



Facebook's iPhone service gives users quick access to the most common features of the social networking site

> "People are still thinking too much about desktop experiences, shrunk down" Ronan Cremin

your goals in mobile requires a lot of trial and error. What works for one might not work for another.

What to make mobile

Deciding which elements of your site to make mobile could be the subject of an article in itself. It's easier to say what you shouldn't: your entire site.

"You can't solve a mobile itch with a desktop scratch," advises Ronan Cremin of dotMobi (dev.mobi). "People are still thinking too much about desktop experiences, shrunk down. It's much like when we first experienced the web and designers tended to think, 'This is a new, smaller billboard', rather than thinking of it as a new medium with new capabilities. It took us a while to get used to it; let's not make the same mistake again with the transition from desktop to mobile."

Taking your entire site mobile is relatively simple, but adds to the user's burden of sorting through overly complex information architectures, bad clickstreams, and worst of all, suffering the pains of network latency with each click.

The key to what to make mobile is context. "Context, not content, is king in the mobile space," says Cameron Moll (cameronmoll.com). "Ignore the importance of context – circumstances and conditions that surround a mobile experience, and the limitations and opportunities presented by mobility – and your content is of little value to users. Embrace it, and you've got the start of what could become a great mobile experience."

Your mobile site should reflect the best of the best. The most active, the most popular, the personalised, the unique. Boil down your site to just the bare essentials and start there. Leave everything else out.

Choosing a device path

Now the trickiest part of taking your site mobile isn't building the site (that's relatively easy), it's deciding which device path you're going to take – in other words, which mobile devices/browsers you're going to support and which you aren't.

Coming from the desktop web, you're probably accustomed to supporting all the top browsers. In the mobile web, that's completely impractical for all but a select few of well staffed (and well funded) companies. You'll need to limit the number of devices you plan to support to a handful. Otherwise you get yourself into the sticky wicket of content adaptation, or rendering different content – including design, markup and image sizes – to different devices, which is where your time and cost investment can quickly skyrocket.

(This is usually the point where most people sigh in frustration and want to give up on the mobile web. But stay with me, there is hope.)

"Start with the Mobile Web Best Practices (w3.org/Mobile)," advises Daniel Appelquist, Vodafone Group's senior technology strategist and co-chair of the W3C Mobile Web Best Practices working group. "This will get you started on the right track for mobile web development across a range of devices, including low-end ones. But then go one step further and embrace the capabilities of advanced browsers on higher-end devices – like Scripting, CSS, Ajax – and provide a great, dynamic and rich user experience on these platforms on those devices using these technologies."

To explain these levels of support in more detail, I've divided devices into four categories:

1 Lowest Common Denominator

Supports all phones

The lowest common denominator (LCD) approach is limiting the design to the most basic markup and styles in order to support the maximum number of devices. Up until recently, this meant nothing more than a white page full of blue links, designed for 120-pixel screens. But the LCD approach is simple to do; just about all phones support it. If your goal is to support hundreds of phones, this path is for you. Take the Yahoo! mobile site (m.yahoo.com/):

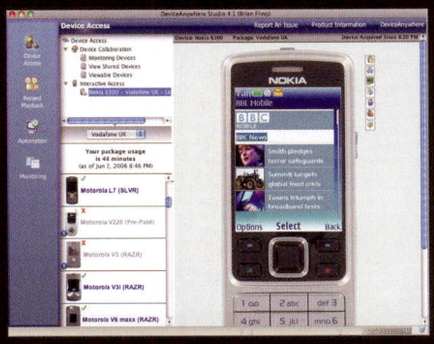
```
<?xml version="1.0" encoding="UTF-
8"?><!DOCTYPE html PUBLIC "-//WAPFORUM//
DTD XHTML Mobile 1.0//EN" "http://www.
wapforum.org/DTD/xhtml-mobile10.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"
```

Multiple devices How to check your site works on different phones

Probably the trickiest part of taking your site mobile is testing and dealing with all the different devices. If you're building a site for just one, such as the iPhone, then you're in luck (if you don't have an iPhone, now you have a great excuse to buy one!). But if you're designing for multiple devices than you'll need to sprinkle your desk with as many handsets as the mobile fairy will grace you with.

Luckily, there are helpful resources available for the desktop to help you with this task. DeviceAnywhere (deviceanywhere.com) provides remote access to actual handsets, not emulators. This is a very useful way to test across multiple handsets, without having to deal with actual handsets (and device plans!). And through a partnership with dotMobi, you can have access to five hours for free using the Virtual Developers Lab (dev.mobi/vdl).

Depending on the number of phones you choose to support, testing can easily account for one-third or up to half of your overall production time. Give yourself time, but within limits. Tell yourself you only have one week to test as many phones as you can get your hands on. Prioritise your test cycle, focus on the most popular phone first, then test, fix, test. Then go on to your second most popular phone – test, fix, test – and so on down the line. By the time you reach your time limit, you'll probably have to make some cuts at some point. It's okay, you can't support everything.



DeviceAnywhere enables you to remotely control real devices – great for testing across multiple handsets

Regardless of your device path, be prepared for a lot or trial and error to get things right. Remember that the more ambitious you are with the number of devices you plan to support, the less you'll be able to do.

For this reason, I recommend starting with just one device and one device path. It's up to you to find the right balance between a good user experience and your development investment. The pivot point will depend on your site and your users, but I guarantee that, with a little bit of research, you'll find what is right.

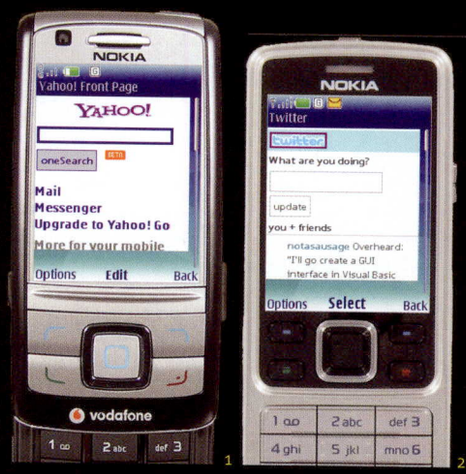
```
xml:lang="en">
<head>
<title>Yahoo! Front Page</title>
<style type="text/css">
div.a,div.h{ text-align : center}
a{ text-decoration : none}
img{ border : 0}
.e{ font-weight : bold; margin-top : 1em}
.f{ border-bottom : 1px solid #bcc7cc; color :
#676767;margin-top : 0.500em}
.b{ border : 1px solid #000099;margin-top :
2px;padding : 0;width : 100%}
.c{ background-color : #bcc7cc;border : 1px solid
#000099;color : #000099;font-weight : bold}
.c:active{ background-color : #000099;color :
#bcc7cc}
.h{ margin-top : 1em}
div.i{ text-align : center;background-color :
#dedae2;border-top : 2px solid #7b0099}
div.i,div.i a{ color : #ada4b6;font-size :
xx-small;text-decoration : none}
.d{ position : relative;top : 2px}
</style>
</head>
<body>
<div class="a" id="top">
<a name="top" id="top"></a><img height="18"
width="88" src="http://us.i1.yimg.com/us.yimg.
com/i/w/b/yahoohr2v1.gif" alt="Yahoo!" />
</div>
<p>
  <a name="search" id="search"></a>
</p>
<form method="get" name="searchform"
 id="search" action="/p/search">
  <input type="text" name="p" class="b" /><br />
  <input type="submit" name="submit"
value="oneSearch" class="c" /> <img height="9"
width="20" class="d" src="http://us.i1.yimg.com/
us.yimg.com/i/w/t/en_us/newi2v1.gif" />
</form>
<div class="e">
  <a href="/p/mail">Mail</a><br />
  <a href="/p/messenger">Messenger</a>
</div>
<div class="f">
  <b>More for your mobile</b>
</div>
<div class="g">
  » <a href="/p/addressbook">Address Book</
a><br />
  » <a href="http://wap.oa.yahoo.com/
raw?dp=cale">Calendar</a><br />
  » <a href="/p/dd">Driving Directions</a><br />
  » <a href="/p/finance">Finance</a><br />
  » <a href="http://m.flickr.com">flickr</a><br />
  » <a href="http://mobilegames.yahoo.com/
">Games</a><br />
  » <a href="/p/mail">Mail</a><br />
  » <a href="/p/messenger">Messenger</a><br />
  » <a href="/p/movies">Movies</a><br />
  » <a href="/p/news">News</a><br />
  » <a href="/p/search">oneSearch</a><br />
  » <a href="/p/sports">Sports</a><br />
  » <a href="/p/weather">Weather</a><br />
  » <a href="/p/countryswitch">Yahoo!
International</a>
</div>
<div class="h">
  <a href="#top"><img height="18" width="88"
src="http://us.i1.yimg.com/us.yimg.com/i/w/b/
yahoohr2v1.gif" alt="Y!" /></a>
</div>
<div xmlns="http://www.w3.org/1999/xhtml">
  <div class="i">
    <a href="http://us.m.yahoo.com/">Yahoo!</
a><br />
    <a href="http://us.m.yahoo.com/p
logout">Sign Out</a><br />
    © 2008 Yahoo! Inc - All rights reserved<br />
    <a href="http://us.m.yahoo.com/p
privacy">Privacy</a> | <a href="http://us.m.yahoo.
com/p/legal">Legal</a> | <a href="/p
help">Help</a>
  </div>
</div>
</body>
```

Note the lack of well-formed HTML or style sheets. With the LCD approach we're basically flowing content in a limited amount of markup. Since style sheets can't be relied on with older devices, we use markup to control our presentation.

2 Baseline

Supports nearly all phones

The next level up is to start incorporating limited Wireless CSS into our design. We'll use formed XHTML-MP, which is virtually indistinguishable from XHTML Basic, a subset of XHTML. Our goal will be to have our markup and styles fully separated. This is the approach recommended by the Open Mobile Alliance, the W3C Mobile Web Initiative

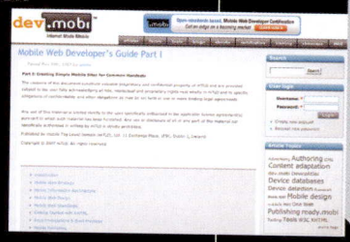


1) Yahoo! uses a lowest common denominator approach to simplify access to all mobile users 2) Twitter's lowest common denominator site serves its purpose well

Supporting all the top browsers is impractical for all but the most well staffed companies

Where to learn more

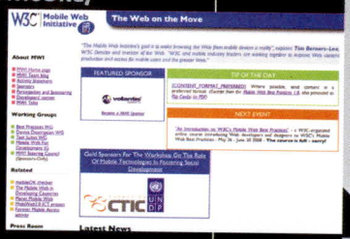
Site: dotMobi Mobile Web Developers Guides
URL: dev.mobi/book
A series of free books provided by dotMobi. I co-wrote one of these, *Creating Simple Mobile Sites for Common Handsets*, which details building a mobile website from start to finish.



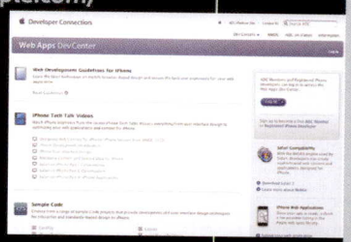
Site: Designing the Mobile User Experience
URL: littlespringsdesign.com
Barbara Ballard proves a comprehensive guide to the mobile user experience, offering guidance to help make appropriate product development and design decisions.

Site: Mobile Web Design Book
URL: mobilewebbook.com
Cameron Moll provides a web standards approach to delivering content beyond the desktop. Some great discussion points on mobile context and lots of handy examples.

Site: W3C Mobile Web Initiative
URL: www.w3.org/Mobile/
The W3C has a variety of initiatives to help developers enter the mobile space including the Mobile Web Best Practices Essential reading for anyone developing mobile content.



Site: Apple Web Apps Dev Center
URL: developer.apple.com/webapps/
You'll find loads of best practices, code samples and video tutorials here. They'll all, naturally, for the iPhone, but still relevant to other mobile devices.



Detection & adaption

One big decision you'll need to make is how to get people to your site – you need to decide where to publish.

The usual options are m.domain.com, www.domain.com/m/ or www.domain.mobi. All of these will work, so it really comes down to a matter of personal preference. Most sites these days seem to be using /m or .mobi, but I'd suggest having your IT guy set up all three and route to whichever domain you think will be the easiest to market.

The problem with these approaches is that the user has to type in the domain in order to see your mobile site – which is less than ideal on your standard 10-key phone.

The really big brands set up what's known as device detection and use a single domain, such as google.com, route mobile traffic to the mobile site, and web traffic stays in place. Setting up a device detection system can be pretty tricky and is almost impossible without playing around with your server configuration. And device detection doesn't work without loads of device data. Luckily, there are a few tools that come to the rescue.

Site: WURFL
URL: wurfl.sourceforge.net
An open source device-description database that comes in very handy if you plan to roll your own device detection.

Site: DeviceAtlas
URL: deviceatlas.com
A dotMobi-sponsored service that provides both device data as well as an API for creating device detection routines.

Site: Volantis Mobility Server
URL: opensource.volantis.com
The community edition provides an enterprise-grade device detection and content adaptation service.

Site: PHP to detect mobile phones
URL: andymoore.info/php-to-detect-mobile-phones/
If your site is using PHP, Andy Moore has written an excellent client-side script that detects and routes devices.

If you're just targeting Mobile 2.0 devices, you can use JavaScript, which most older ones don't support, and redirect based on user agent, a technique I call Reverse Device Detection. Apple uses a simple reverse detection script on its desktop movie trailers site, redirecting iPhone and iPod Touch users to a version that's optimised for the device:

```
<script type="text/javascript" charset="utf-8">
  if (navigator.userAgent.match(/AppleWebKit/i)
&& navigator.userAgent.match(/Mobile/i)) {
      window.location.replace('/trailersiphone/');
  }
</script>
```

1) Vodafone Live! uses tables to create the best possible design – it might not be a fashionable approach but it sure does work 2) dotMobi provides us with an example of good baseline design that fulfils exactly what the mobile user base demands 3) The BBC has put a lot of effort into its mobile site and it shows. Perhaps surprisingly, its highest traffic comes from the developing world

and dotMobi. Take this example XHTML-MP page provided by dotMobi (http://dev.mobi):

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!DOCTYPE html PUBLIC "-//WAPFORUM//DTD
XHTML Mobile 1.0//EN" "http://www.wapforum
org/DTD/xhtml-mobile10.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
 <head>
  <title>Company</title>
  <style type="text/css">
    .header  { background: #e0ffe0; color: green;
border-bottom: solid 1px green; margin: 0 0 5px 0;
                                  padding: 2px; }
    .footer  { background: #e0ffe0; color: green;
border-top: solid 1px green; margin: 10px 0 0 0; }
    .company { font-weight: bold; }
    hr       { clear: both; border:solid; border
width:1px; border-bottom-color:#007300; border
top-color:#ffffff; border-left-color:#ffffff; border
right-color:#ffffff;}
    .top-news img { float: left; margin-right: 5px; }
    .top-news h3, .news h3 { font-size: large; font
weight: bold; }
    .accesskey { text-decoration: underline; }
    a { text-decoration: none; }
    .validation { margin-top: 10px; }
    .product img { float: left; margin-right: 5px; }
    .product h3, .news h3 { font-size: large; font
weight: bold; }
  </style>
 </head>
 <body>
  <div class="header">
   <img src="logo176.gif" width="112"
height="50" alt="Company Logo" /><br />
   <small><a href="index.xhtml">Home</a> | <a
href="news.xhtml">News</a> | Article</small>
  </div>
  <div class="top-news">
```

```
   <h2>Top News Item</h2>
   <img src="image1-176.jpg" width="176"
height="154" alt="Image for Story 1" />
</p>
```

Next comes a paragraph containing the top news item, followed by a series of paragraphs containing the full article. The top news story is presented with a headline, abstract and image. On devices supporting it, the image will be floated left and the text will flow around it.

If the full article gets too long, the reader will need to scroll through a large amount of text to get to the navigation links if their device doesn't have a 'back' key. To avoid this, you can split the story up into several pages and link them with previous/next links. The disadvantage of this is that it result in a poorer user experience for anyone who wants to read the whole story. As ever in design, it's a trade-off.

```
  </div>
  <div class="footer">
    <small>
     <a href="index.xhtml">Home</a> | <a
href="news.xhtml">News</a> | Article<br />
     &copy; Company Ltd. All rights reserved.<br/>
    </small>
  </div>
```

Using tables is the best way to create a consistent design across multiple devices

Despite their small market share, Smart Phones account for the lion's share of web usage

The following div element provides an easy way for you to check this web page against the XHTML-MP and CSS validators. Once complete, you may prefer to remove this.

```
<div class="validation">
  <a href="http://validator.w3.org
check?uri=referer">
    <img src="http://www.w3.org/Icons/valid
xhtml10" alt="Valid XHTML-MP" height="31"
width="88" />
  </a>
  <a href="http://jigsaw.w3.org/css-validator
check/referer">
    <img src="http://jigsaw.w3.org/css-validator/
images/vcss" alt="Valid CSS" width="88"
height="31" />
  </a>
 </div>
</body>
</html>
```

Here our markup is well formed and semantically correct, much closer to what we're used to coding for desktop websites. But here's the rub: most mobile browsers don't recognise the 'Cascade' in Cascading Stylesheets, meaning that any element you want to style needs to have an defined id or class. We wouldn't want to use: `.top-news p img` Instead we'd be safer using: `img.top-news-img`.

This is less than ideal for those of us who rely on stylesheets to create great designs, but far superior to the LCD approach.

3 Best possible design

Supports most phones, but uses table-based design The next device path is to create the best possible design, which sounds great until you hear how it's done: with layout tables. Yes, that's right: time to party like it's 1999.

You don't hear about this technique that often outside from mobile insiders, but inside the community, we all know using tables is the best way to create a consistent design across multiple devices. Most mobile service provider decks, or mobile content portals, are designed using this technique. In fact anyone serious about a mobile user experience is probably doing it with tables.

We still need to use verbose style sheets to achieve our design goals, but we have much more control of the user experience as well as adding consistency across many handsets.

Needless to say, this approach isn't endorsed by any group publicly. It's one of the dirty little secrets to mobile web design that we may not like, but at the end of the day it gets the job done.

4 Advanced

Supports iPhone/Android (Webkit), Opera browsers The fourth and final device path is a bit controversial, but one I highly endorse, especially for those of us living Stateside. It's to only support the latest generation of smart phones with a desktop grade browser loaded on the device.

These so-called Mobile 2.0 phones like the iPhone, the Nokia N95 or the Android phones all contain some flavour of the WebKit Browser engine. Together with Opera Mobile, they offer excellent support for Web Standard techniques of markup and styling.

While smart phones only account for a sliver of overall device market share, they account for the lion's share of web usage. The iPhone is already the 10th most used browser of ALL web traffic in the United States, accounting for 85 per cent of all mobile web traffic.

The point is, the people with these devices actually use them. The good news for us is that, since these browsers support normal XHTML, CSS2, JavaScript and a good deal of CSS3, taking our site mobile doesn't require any additional knowledge or hacking to adapt for mobile devices as we would for desktop browsers.

On the disc we've provided a code sample from the Brightkite iPhone site – **snippet5.rtf**. This page could easily be a desktop web page, with good separation of markup and styles, and use of multiple classes and Javascript.

Increased abilities to affect the user experience, plus support for the tools and techniques we use, make this technique the easiest to perform, but this comes at the price of supporting other less capable devices.

The question you have to ask yourself is: which device path is right for you? You have to look at your audience, your content and the resources, and decide which direction makes the most sense.

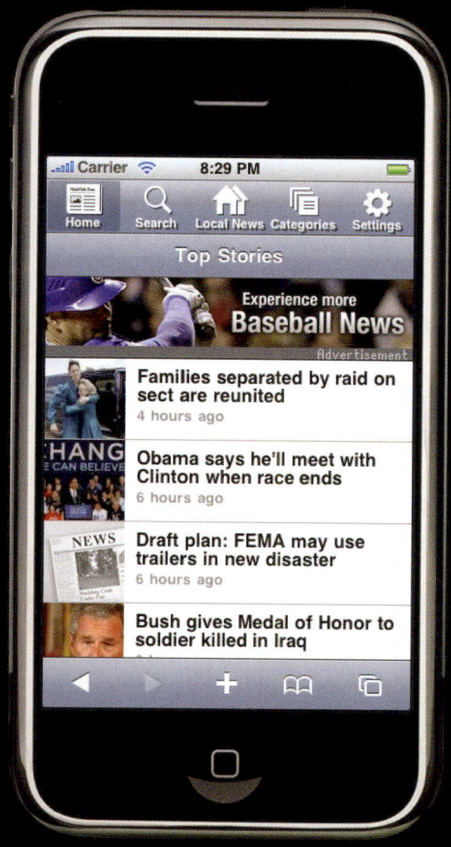
Plumbing the content

Once you've sorted your device path, the next thing to do is to build out your templates and connect it to your CMS of choice. While your CMS most likely supports multiple templates, making it easy to add your mobile templates, it probably doesn't support multiple IAs. Remember what I said before: you shouldn't take your entire site mobile. I usually advise one of two options to get around this obstacle:

Option A: Statical code your primary navigation items into your mobile templates and use a tag or category to filter what content to make mobile. This won't optimise any of your other assets, such as images, but I've found this approach to work pretty effectively with most lightweight content management systems such as Movable Type, Expression Engine or Wordpress.

Option B: Pipe your content via XML to a secondary system and manage which imported content to take mobile, even to the extent of managing secondary mobile-specific IA. This can be done with your programming language or framework of choice to cache and repurpose your imported content.

Either option should do the trick nicely. The ideal route depends on your technical prowess and development resources. Just be wary of overly simple plug-ins or hacks to your CMS that promise to take your site mobile easily. These are often just an apparatus to spit out alternate templates that reformat all of your web content to a mobile device.



The new APNews iPhone site takes advantage of the iPhone, but is still recognisable as a traditional news site

Our goal is to be hyper-aware of the desired actions of the user. Or as Ronan suggests, "Mobile sites should be 'contextually sympathetic' rather than merely smaller. You don't want Coca-Cola's share price on their mobile site, but you do want the location of the nearest Coke machine."

As you can see, taking your site mobile isn't a simple 1-2-3 process that works 100, 75 or hell, even 50 per cent of the time. It's about understanding your users and the technology running your site, and taking the time to get it right. It doesn't have to be a total nightmare, but it can become that if you try to bite off more than you can chew. My advice is to start small with what you can handle and build up from there.

The future of the web is mobile – not just mobile phones, but mobility of information. Our connection with information has become a modern-day necessity. Up until now, information has mostly been disconnected from real life, to the context of our lives. The mobile medium represents that next evolution of the web, and it won't be the last.

Taking your site mobile is taking your first step into an exciting new medium, into an exciting new world and into the future of information. ●

WWW. *Do you think the mobile web is the future? Discuss at forum.netmag.co.uk*

/mobile/ optimise your site for iPhones

Craig Grannell explores some ideas for fine-tuning websites for Apple's increasingly popular smartphone and its very smart browser, Mobile Safari

Knowledge needed: Understanding of standards-compliant design

Requires: iPhone or iPod touch, graphics editor

When it first appeared, Apple's iPhone looked like a massive extravagance, and commentators were quick to leap up en masse and sing a rousing chorus of 'It'll never work'.

Microsoft's Steve Ballmer opined: "There's no chance that the iPhone is going to get any significant market share." He then added another "No chance" just for good measure. John C Dvorak said the iPhone would be passé within months, and that there was "no likelihood" Apple could be successful in the mobile phone marketplace. And marketing expert Laura Ries once claimed that: "The iPhone is likely to be the biggest flop of the 21st century."

But even the biggest of Apple detractors would have to admit that the iPhone hasn't done too badly.

The fourth quarter results for the financial year of 2008 suggest Apple's iPhone business is outselling its Mac offering, which was still up on the same quarter in 2007. Apple even sold more smartphone devices during this period than RIM, the Blackberry people.

In global terms, the iPhone's browser market-share remains tiny – under half of one per cent – but this figure is rapidly growing. And in the handheld space, Apple's speedily carving itself a fairly chunky niche, ably assisted by its iPod touch hardware, which also enables mobile browsing. (After all, the iPod Touch is pretty much the iPhone without the phone.) iPhone users also spend more time online compared with users of other handheld devices.

Facebook defaults Facebook has embraced the iPhone, providing a standalone iPhone application, but also a website that defaults to an optimised version (right), superior to the squint-o-vision desktop version (left): iphone.facebook.com

Expert tip Don't think Mac

Although the iPhone is a creation of Apple, it's not a Mac. Sure, it runs OS X, but it doesn't run Mac OS X, and the majority of iPhone owners don't actually own Macs. So when you create your iPhone-optimised website, don't splatter it with Mac-oriented design conventions. Instead, gear whatever you do towards the things mentioned elsewhere: usability and clarity. Despite its glossy icons, iPhone is largely about function over form, and your website optimisations should follow suit.

Mobile Safari

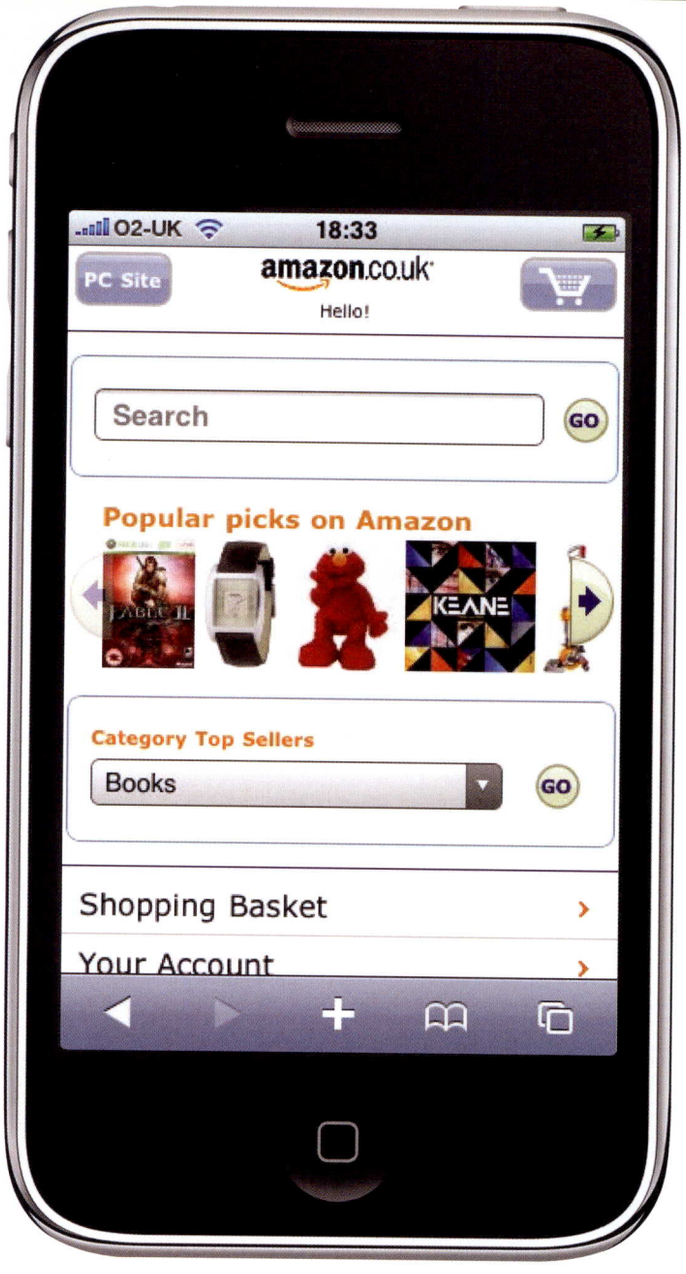
Most of the reason for the iPhone's success in the browsing space is down to Safari, the built-in web browser. Based around WebKit, the same engine used in the desktop version of Safari (and also in Google's Chrome), the mobile version is to a large extent the same as its older cousin. Although it lacks support for various plug-ins (notably Flash; something that appears to, for some reason, send certain people into an apoplectic frenzy), it nonetheless makes a good stab at rendering websites in a manner almost identical to what you'd expect to see on a PC or Mac, only smaller (iPhone's screen resolution is 480×320).

By default, websites appear in pint-sized versions, with text generally being illegible and links being practically impossible to target. But by using the multi-touch 'pinch' gesture, a page can be zoomed and then dragged around. Links are accessed by pressing down on them, and despite its small display area, the iPhone nonetheless provides an experience akin to tabs, making multiple pages and sites available for viewing. Many users consider the browsing experience so desirable that they prefer surfing on the device to using a laptop. However, all is not entirely rosy in the land of the iPhone, and developers could do more to help.

By default, websites appear in pint-sized versions, with text generally being illegible

Feeling the pinch

For regular iPhone surfers, accessing website after website with teeny-tiny content can get a bit draining. BBC News is a case in point: when you first access it, the site is basically unusable and illegible bar, perhaps, the lead headline. Link targets are absurdly small (and yet annoyingly easy to trigger by accident), and you're therefore forced to zoom in and scroll about in order to



Clutter free Although a general mobile site rather than iPhone-specific, the simplified layout, large hit areas and lack of clutter of Amazon's offering (www.amazon.com/gp/aw/h.html) provide pointers to iPhone website developers

view content. When your iPhone is oriented horizontally, BBC News becomes just about readable, although links are still small. Ultimately, developers have two options when deciding whether to cater for the iPhone in the kind of way the BBC hasn't: create an iPhone-optimised site or create an iPhone-specific site. (There is a third way – creating a standalone application for accessing a website's content – but unless you're an Amazon or a Facebook, that's not a realistic proposition.)

The first of those choices is something that should be considered by anyone working on a site likely to be visited by a significant number of iPhone users, especially because it doesn't require a great deal of effort. To a large extent, working on an iPhone-optimised website is akin to dealing with print style sheets. As long as you're building sites using semantic markup and using CSS to style your layouts, you can create an alternate style sheet for the iPhone to present a streamlined, simplified version of your website.

Keeping it simple

When it comes to thinking small, some designers and developers might feel constrained. After all, many are now used to more space rather than less, due to the typical web user now having a monitor resolution of 1024×768 or higher. But when you're using a resolution half that of the now largely defunct 800×600, something has to give.

Ultimately, you need to hone things down, retaining only the most important content. Retain your brand and important links at the very top of the design, and ensure hit areas are large (after all, people will be tapping

Let's twist again

A new spin on site navigation

Not content making an iPhone-optimised website, Engage Interactive (engageinteractive.co.uk) went a stage further, crafting a site that takes advantage of the device's accelerometer. This nifty piece of technology knows which way an iPhone is oriented, and various applications display content accordingly – for example, iTunes switches from List view to Cover Flow when an iPhone is rotated into landscape position.

The bright sparks at Engage decided to do the same with their iPhone website. Hold your iPhone in portrait mode and the company's blog is shown. Rotate your iPhone right and you can see a mini portfolio. Rotate it left and an 'about' page is displayed.

It's all jolly clever and perhaps hints at a more directly interactive future for the web – or at least the mobile part of it. And with Engage kindly outlining the basic process on its blog – see tinyurl.com/5u36pd for the walkthrough and tinyurl.com/69dc22 for the original iPhone post – you can get in on the act.

New angle With some nifty scripting, you can create content that changes depending on an iPhone's orientation

them with podgy fingers, not using the bullet-like accuracy of a mouse pointer). With the fold being either positioned at around 420 or 270 (some space on the iPhone's display is used for browser chrome), you need to get to important content quickly, so don't waste further space on secondary navigation or sidebar-housed content; instead, place that elsewhere, after your lead content. (Linear is the way to go.)

Also, ensure text is readable by increasing font sizes. Because the iPhone has a higher pixel density (163ppi) than a typical PC monitor, fonts sized for standard browsers tend to display very small on Apple's device. For example,

Ultimately, you need to hone things down, retaining only the most important content

in vertical orientation, 20px is just about readable, but small: 30px is more comfortable for body copy. In horizontal orientation, 20px is comfortable, and while you can get away with 16px text, it becomes illegible when you go back to portrait positioning.

Layout considerations

In the same way that horizontal scrolling in desktop browsers disorients and annoys desktop users, iPhone users aren't keen on dragging pages around, at least once the novelty has worn off. Optimise your site width for the horizontal maximum of iPhone (480px) at the widest, and avoid too many inline devices that split this space into columns, because >>

>> otherwise you'll end up with very few words on each line. If you have an iPhone to hand, get inspired by the elegance of built-in applications, such as Settings and Calendar.

Once you're done, the simplest way of implementing your changes is by using JavaScript to attach an iPhone-specific style sheet with your overrides:

```
if ((navigator.userAgent.indexOf('iPhone') != -1) ||
(navigator.userAgent.indexOf('iPod') != -1))
 {
 var cssNode = document.createElement('link');
 cssNode.setAttribute('rel', 'stylesheet');
 cssNode.setAttribute('type', 'text/css');
 cssNode.setAttribute('href', 'iphone.css');
 document.getElementsByTagName('head')[0].appendChild(cssNode);
 }
```

Note that if you want to provide iPhone users with more choice, you could offer a CSS switcher, enabling them to switch between the standard and optimised versions of the design. By utilising platform sniffing, or placing the switcher controls in a div only visible to iPhone users, you could make it so the switcher isn't seen by users of other platforms.

Starting from scratch

If you've got a lot of time and resources, you might consider going the whole hog and creating an iPhone-specific website. This is only a relevant choice for when you have a very large potential iPhone/iPod Touch user base (such as Facebook), or are creating a very iPhone-centric website (such as a site about applications for the device).

iPhone users aren't keen on dragging pages around, once the novelty has worn off

The bulk of the tips we've covered up to this point remain relevant when it comes to creating an iPhone-specific website, but you have the added advantage of being able to define rules specifically for a single device. Make sure you design to the screen resolution of Apple's phone, and keep things tidy, simple and honed down. Or, if you fancy 'thinking different', ape Engage Interactive and take advantage of iPhone's accelerometer: see 'Let's twist again' on the previous page.

Code-wise, you can automate flinging users towards your optimised site by modifying the JavaScript shown earlier:

News to confuse On first accessing the BBC News website, almost everything's illegible, forcing zooming and scrolling. By comparison, CNN provides an optimised (if ad-infested) entry page that's good to go immediately.

```
if ((navigator.userAgent.indexOf('iPhone') != -1) ||
(navigator.userAgent.indexOf('iPod') != -1))
 {
 document.location = "http://iphone.yourdomain.com/";
 }
```

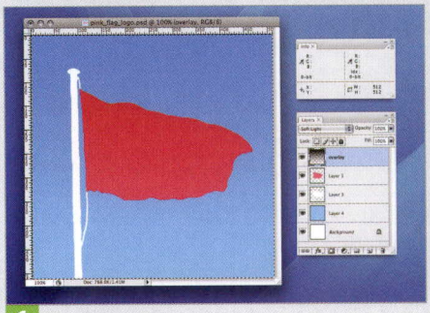
Also, if you do decide on creating an iPhone-specific website, be mindful that not everyone will want to use it. You should always enable people to return to the standard site if they wish, preferably by displaying a prominent link towards the top of the homepage of the iPhone-specific site.

You might still be wondering if it's worth making the effort for the iPhone. Right now, the market is small, but it's going to grow – and rapidly. Once other manufacturers start playing catch-up (not least Google), we'll start to see a big switch to people surfing using handheld devices. To that end, getting in on the ground floor before everything goes crazy is a good idea. And the fact that a good mobile site really makes you focus on what's important – clarity, simple layouts, important information, clean design – can only help when you come to work on websites back in the land of 'normal' web browsers. ●

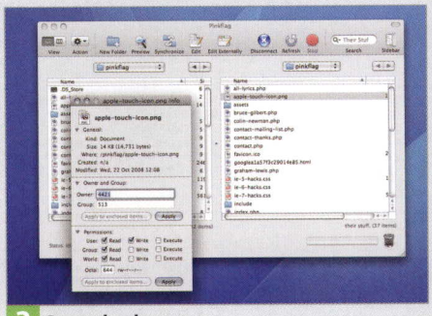
About the author

Name Craig Grannell
Site www.snubcommunications.com
Areas of expertise Information architecture, site concepts
Clients Swim~, Rebellion, IDG
Which football team (if any) do you support? Local ones (Reading, Aldershot and Fleet Town) – vaguely.

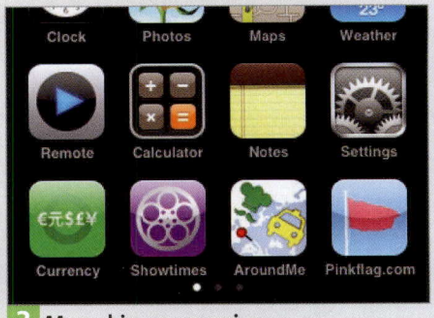
Step by step Create an iPhone homepage icon



1 Create an icon
Use your graphics editor of choice to create a flat, square icon. Although iPhone icons are 57 pixels square, you can make yours bigger and iPhones will scale it. Avoid too much detail and leave space at the edges, otherwise your icon will look cramped. Also, try adding a black-to-transparent 'soft light' top layer for added punch.



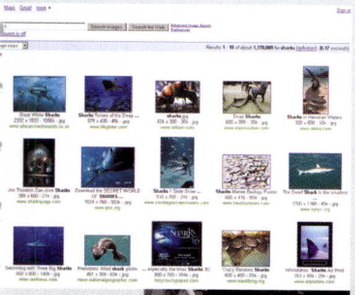
2 Save the logo
Save your layered document in your graphic application's native file format (such as .psd for Photoshop), and then save a separate flat version as a .png, using the filename **apple-touch-icon.png**. Upload this file to the root of your website (not the root of your server). Standard browsers will be unaffected by this document.



3 Marvel in your genius
When someone visits your site using an iPhone or iPod touch and uses Safari's **Add to Home Screen** option, your creation will be used as the basis for the icon, rather than an indistinct crop of the website itself. Note that iPhone software automatically adds rounded corners and the gloss effect, so don't do that yourself in step 1.

business

Expert insights into search, marketing, analytics and more



(above) **search engine indexing/Dan Crow p146** – "Google's crawling and indexing systems have become more intelligent"

(below) **interview/Marissa Mayer p142** – "I felt we had about a two per cent chance of succeeding"

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(left & above) **advanced SEO/Gary Reid p150** "Getting SEO right can be the difference between failure and success"

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150 feature/advanced SEO tips
156 interview/Jason Calacanis
160 web pro/success with Twitter

analytics >

162 feature/Google's guide to analytics
168 tutorials/get more out of Google
171 opinion/danger! analytics!
172 web pro/change tracking

marketing >

174 feature/boost your career
179 opinion/blogging on brands
181 opinion/email marketing
182 web pro/optimise your site

hosting >

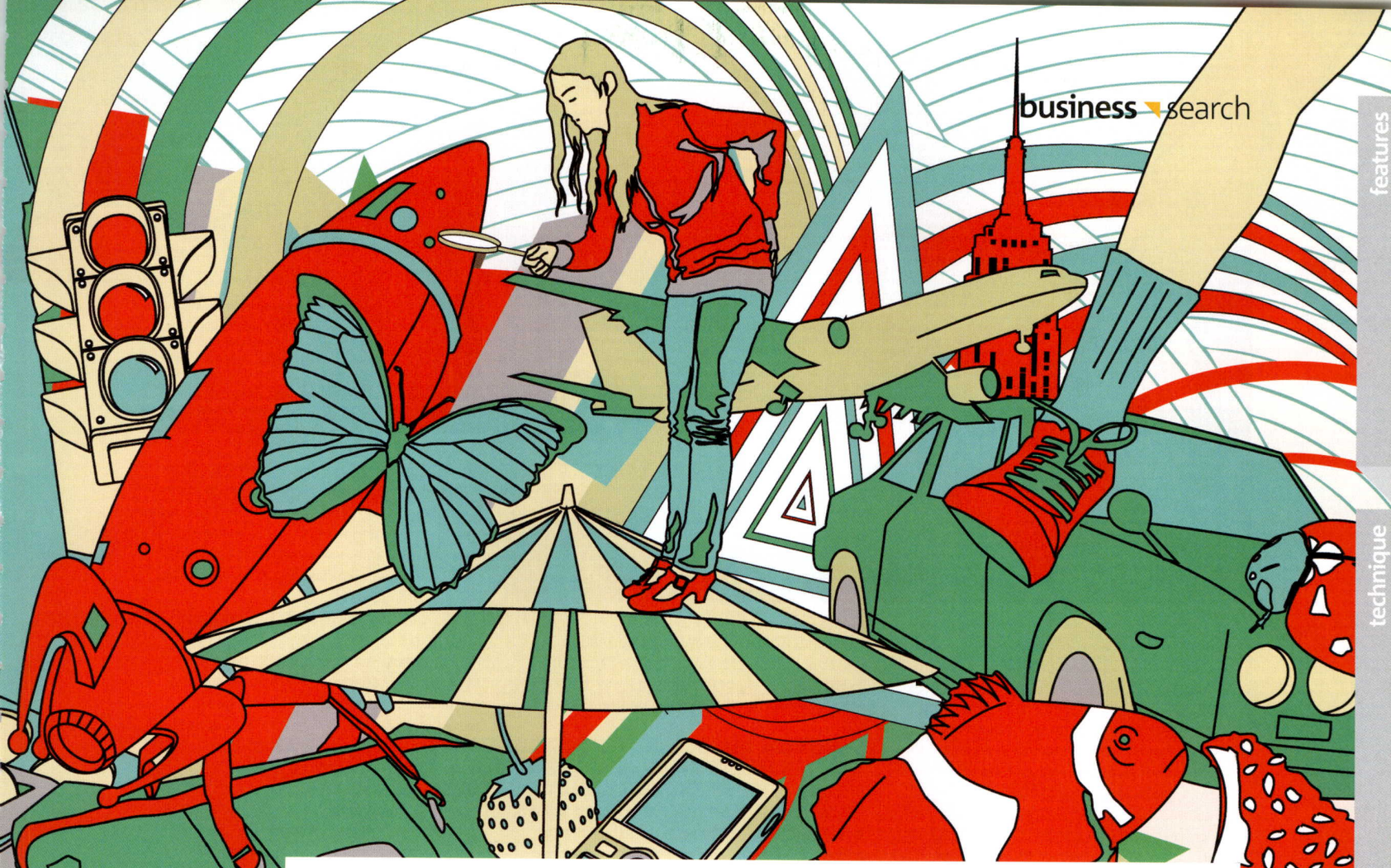
184 feature/cloud computing
189 interview/Jeff Barr
190 opinion/design, build & host
192 web pro/hosting bundles

security >

194 feature/secure your site
204 feature/design thieves
209 opinion/breaking & entering
210 web pro/password protection

advice >

212 10 pages of expert advice



The future of search

Search is evolving far beyond Google's classic 10 blue links. **Paul Douglas** reveals how you can stay ahead of the curve

Words One-time editor of .net, **Paul Douglas** is currently editor at consumer technology news and reviews site TechRadar. www.techradar.com

Image ilovedust Multidisciplinary studio ilovedust provides creative solutions for print and web. ilovedust.com

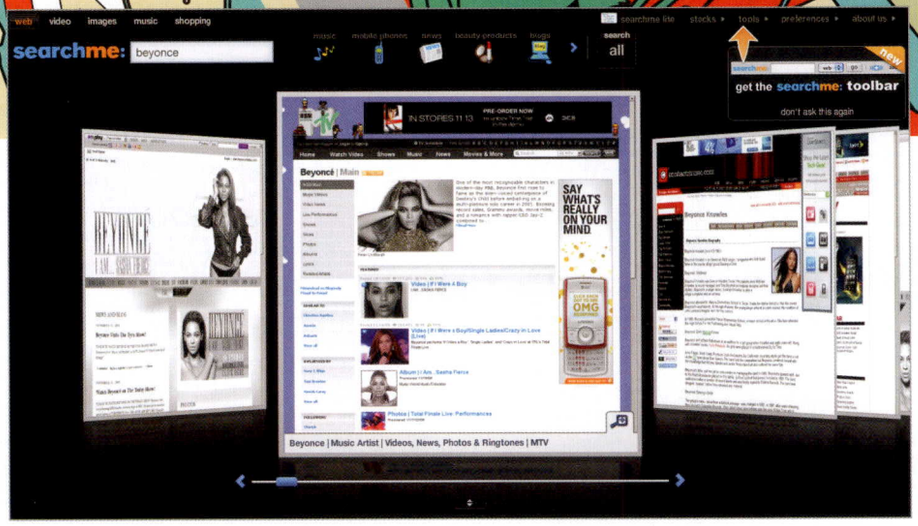
The world of search is changing, and changing fast. The days of people typing two words into a search box and hoping for the best are numbered.

Companies big and small are moving things forward, experimenting with searches based on complex sentences, images and audio, mashing up mobile search with location data, and aiming to make results more useful than just the traditional list of blue links.

One approach is to show results in a more visual style. Viewzi (www.viewzi.com), for example, has a number of options, including viewing results from Flickr as a photo thumbnail cloud; viewing thumbnails of web pages found by Google, Ask, Yahoo and Live Search on one page; and viewing news results from Google News in the style of a newspaper front page. Seachme (searchme.com), which recently raised $31million in funding, also presents its results as a series of web screenshots, mimicking the iTunes Cover Flow look.

For books, zoomii.com uses the Amazon search API but presents the search results as book cover thumbnails. Amazon must have liked the idea as it recently launched its own version, Amazon Windowshop (windowshop.com) – though this doesn't have a search option, and only lets you browse Amazon's new releases and popular content.

PicClick (picclick.com) throws eBay into the mix. To use PicClick, enter a search term, your minimum and maximum price, and your (US) postcode. PicClick then scours Amazon or eBay and returns a list of thumbnail images. Briteclick (www.briteclick.com), meanwhile, takes a different >>



Far left Rather than just blue links, searchme.com presents results as a series of screenshots

Left Juergen Galler predicts a move towards longer search queries

>> approach: it's a browser add-on that lets you right-click words on the web page to perform searches for maps and prices, so there's no need to leave the page you're on when you want to search for related sites. Firefox, too, lets users right-click a word on a page and search for it in Google, while the extension Advanced Dork (addons.mozilla.org/en-US/firefox/addon/2144) adds a contextual right-click search that lets you highlight a keyword and search Google using advanced operators, such as intitle and inurl. And of course, you can already search in-browser via the search box in the top right-hand window of Firefox and Internet Explorer.

None of these services are really changing the way we search: they're merely changing where we search from or the way the information is presented. But there are also moves afoot to fundamentally change the results – to make them more relevant to the intention behind the search.

Structured search

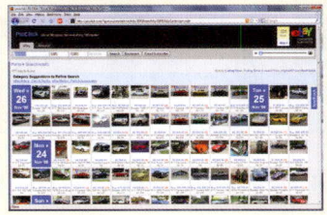
It's currently hard to make searches that consist of more than one or two variables. 'Cheap holidays' is easy, but 'One-week break on a warm island that takes less than three hours to fly to and will cost less than £1,000' is pretty much impossible without a lot of hitting the back button to refine your query.

This needs to change, Juergen Galler, director of product management at Google, tells us. "It should be easier for users to define something like 'I would like to go to an island with good weather, and my budget is this, and I want to fly less than two hours'," he says. "You can apply this to other categories, so if you're looking for a job, a new car, a new apartment, you have many more research-based queries where you need to drill down."

It's ironic that we should be considering a move towards longer search strings, says Paul Stoddart, senior product manager at Microsoft Live Search: "If you go back to the beginning of search where people like Ask Jeeves were asking us to put in long queries and it would find you the answer, it just couldn't do it. Google came along and said 'Actually, just put in one or two words and we'll get you close, and then refine it a bit further and we'll get you closer'. So we've trained people not to use structured search queries. People will have to change their behaviour for search engines to really build upon that.

"At the moment, we're reacting to how people are searching – and most people just put in one or two words. Our job is to try to figure

Pioneers Innovative search engines



1 SnapTell Browser

itunes.apple.com/WebObjects/MZStore.woa/wa/viewSoftware?id=291920403&mt=8

Take a photo of a book or game cover with your iPhone and upload to SnapTell's servers to buy the product or learn more about it from sources such as Wikipedia. It doesn't take much imagination to see how this could develop to give you information about buildings that you photograph, and even search sites such as Facebook for people.

2 TinEye

www.tineye.com

TinEye "does for images what Google does for text". Upload an image to TinEye, or point it to one that's already on the web and the search returns a list of sites where that image can be found. It will even find images that have been cropped and edited in an attempt to hide their origins. Wouldn't it be cool if you could upload a picture of, say, a celebrity at the Oscars, and see other photos of the same person from that event? Can't be too far off.

3 PicClick

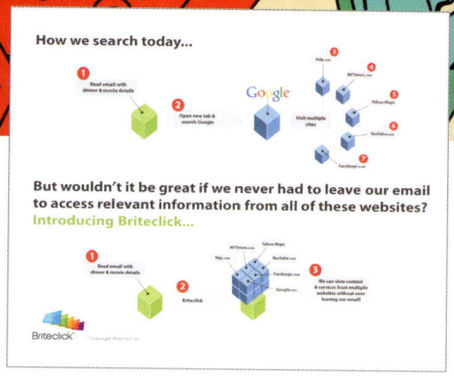
picclick.com

PicClick lets you browse eBay and Amazon visually. Enter a search term and get a page of thumbnails as your results. It's the brainchild of Ryan Sits, who told startupSD.net: "I do a lot of buying on eBay, and found eBay's standard website too slow and cluttered. I really just wanted to see a ton of photos all on one page, without all the banner ads, wasted space and paging that's on eBay's standard site. It's helped me find more deals faster than anyone else on eBay."

4 SeeqPod

www.seeqpod.com

Founded in 2005, SeeqPod is a music and video search engine and player in one. The engine crawls the web to build up an index of music and then allows you to play it from the SeeqPod search results. We searched for the theme song from classic 80s cartoon *Thundercats* and instantly got five streams to choose from: result! By creating a free account you can save and share playlists. The current iteration of SeeqPod launched in 2007.



Time-saver You can search for related sites without leaving the page you're on using the browser add-on Briteclick

Web head Could we search our own brains?

What if search engines knew what we did last week? Apparently, it's entirely possible ...

Forget the web for a second: we all have loads of information we need to retrieve from our brains. Did I pay the gas bill? Who phoned me last week to talk about an upcoming web conference? What was that great movie I saw a couple of months back?

The idea of plugging a search engine directly into our brains is attractive in many ways, but fraught with ethical dilemmas. Says Google's Juergen Galler: "I want to have my brain for me. I don't really think that's something that we should approach. Maybe it will happen: everything's possible. I personally think there is a certain level of privacy that we should respect from an ethical perspective, and your brain is yours, and my brain is mine."

Stoddard agrees, while raising an interesting, and highly feasible, idea: that we could very easily search our own memories through information that's already available, with no need for an intrusive brain implant.

"If I look at my life, virtually everything I'm doing these days is digitally recorded, whether it's through photographs, or through Outlook, or my history of web searches and my cookies, my mobile phone calls," he says. "You can tell when I'm online at home and Media Center knows what I like to record. So actually you're almost at the stage where, although you can't interrogate my brain, I can probably work out a lot of what you were doing semantic search-wise. At some stage you'll be able to enter a really structured search such as 'I spoke with a guy last January about something' and search could piece it all together and say, 'This is the call, and this is where you were and here are the photos you took while you were there.' So I'm not saying we'll get to the stage where you say 'What where all the things I thought about on this day?' and it pumps all that stuff out of your brain – although who knows? But you could certainly get to the stage where, if we had the right privacy policies, everything could be tracked and kept. It would be amazingly interesting to figure out what you could learn about yourself."

out how we can get the best results based on the searches people are doing and if people change their behaviour and start putting in 20 words then the algorithm will pick up on that and start training itself in that respect."

It won't be a quick and easy task, adds Stoddart: the more words entered into a search query, the harder it is for the search algorithm to return the best results. "But users should definitely experiment with search engines and what they're putting in. We tend to think of something and then dumb it down to put into a search engine: maybe it's time to start thinking about not doing that."

Location-aware search

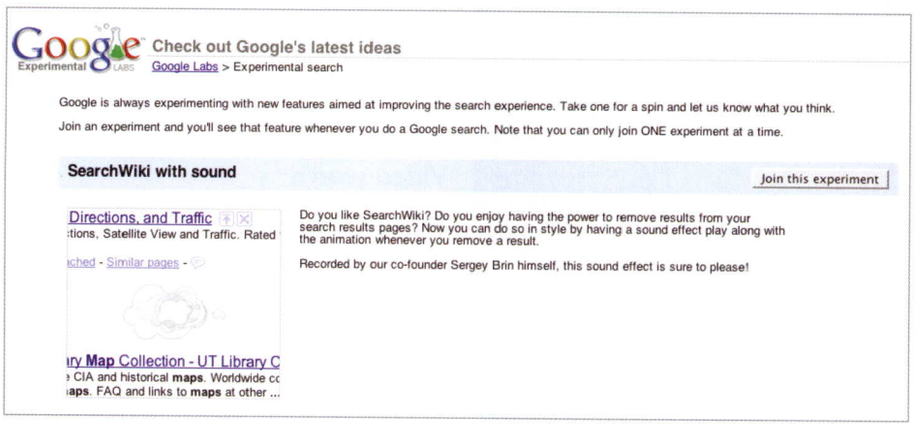
When you carry out a structured search, it helps the engine enormously if it knows your location; then it can suggest places close to you, for example. And location-aware search is clearly going to become more and more relevant as more people start searching via mobile phone.

Google has improved its mobile search a lot, Galler tells .net, but it has some very specific challenges. "What we're making sure is that we have the same level of quality that we have on the web, and then we can focus on adapting the 'use case' for the users, so the way we show search results on the phone is very different to the way we show them on the web.

"We want to be much more local, so we include a lot more location-specific signals to allow for a more specific search around the geographical location of the searcher." This is made much easier with richer UIs on devices such as the iPhone, he says. "It's much harder to provide a good mobile search experience on phones that don't have the same level of browser."

Mobile search is also a function of other search engines, including Live Search. "If you go to m.live.com today, there's a thing on there that says 'find me' and it figures out where you are," says Stoddart, adding that location-aware search is also important when we're searching from PCs.

"Local searching is really important to us as a company, and not just on mobile search," he says. "A large proportion of searches done on the web today are location-based. For example, 'I want to find a restaurant in this area'. Wouldn't it be great if the search engine knew where you were? That could work by you defining where you are: for example, 'I'm at work' or 'I'm at home', and the search engine has a list of your different addresses. Or it could hook up to your mobile. Location-aware searching is an area where we're poised to do some really exciting stuff in because it's all about this connected world."



Making it personal Google's SearchWiki service is part of a growing trend towards the customisation of search

Real-time local search

Once the search engine knows where you are, you can expect more real-time information. Search is currently weak for local, real-time information. For example, you can't ask 'Why is there a traffic jam outside my house? Should I take a different route to work?' Galler says this will improve. "Local information and local search is something of huge value and we're working on improving the local aspect of our search results."

He adds that the traffic example isn't far away. "In Japan there are a lot of traffic sensors in the metropolitan area that already give you that information. We're working with several partners on improving local traffic information, and to improve local information in general. If you go into Google Maps today and you search for a specific route, the product has improved a lot: we add traffic routes, we display train departure times depending on your location, and so on. We're really improving a lot there.

"Personally I think that local information is going to become even more important in the future. If you search for a product – for example, you say 'I want to buy some Adidas sneakers' – it might be good for you to know which online shops have the product. But if we can say that the shop around the corner also has them, that local aspect of search is something that we value."

Stoddart cites working examples of traffic monitoring via Live Maps in the US. "The US Live Maps site has great examples of this, where they have real-time flow data of traffic. You can say 'I'm going to leave to go to

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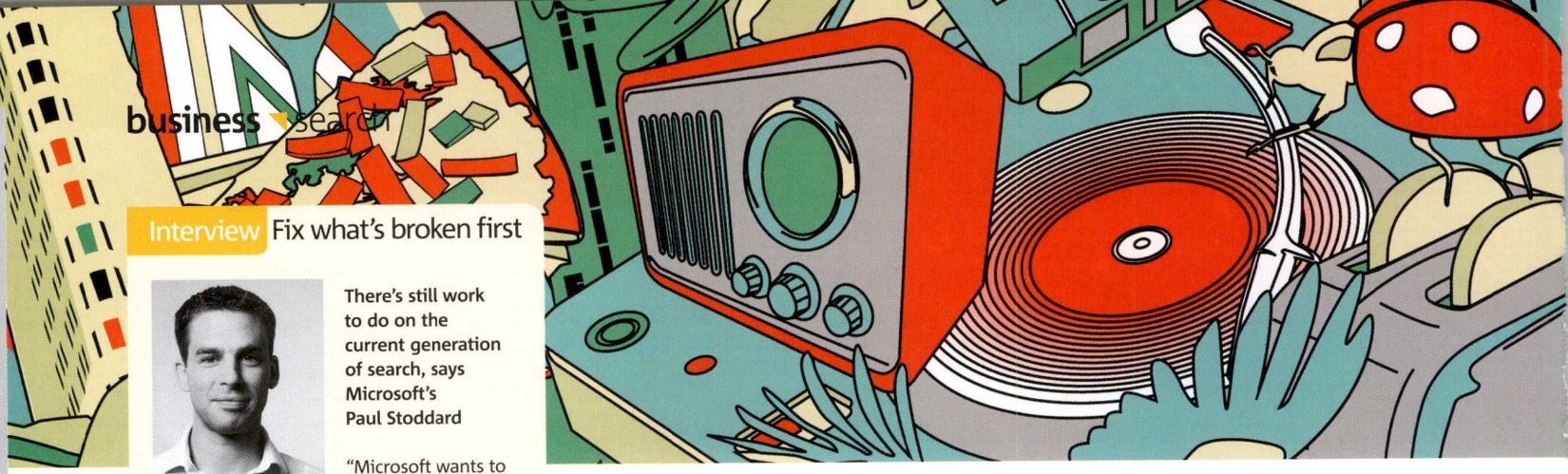


business ▸ search

Interview Fix what's broken first

There's still work to do on the current generation of search, says Microsoft's Paul Stoddard

"Microsoft wants to be in something for a reason. And the reason we want to be in search, the primary reason, the one we've been tackling for the last four years, is that it doesn't matter what search engine you look at, 40 per cent of queries go unanswered. You could put a random query into any of the search engines and you won't get a suitable result within the first page: 40 per cent of the time is a huge amount.

"It's like going to the supermarket and finding that 40 per cent of the time, there's no food there. Getting results 60 per cent of the time is considered fantastic, and it is a lot better than where we used to be, but even when you get the answer back that you wanted, 50 per cent of the time you re-query it. For example, I might put in Madonna and get back a load of answers, but actually I want Madonna videos, so I put in 'Madonna videos' and I re-query it because the search engine hasn't yet figured out what you're really looking for.

"So from our perspective, we have these two statistics, which is that 40 per cent of queries go unanswered and 50 per cent get re-queried, and that's a massive thing to fix. Google is working on it, Yahoo is working on it, we're working on it, and until we get these fundamentals of the core search right – so I put in 'Madonna' and it comes back with a really relevant result and it adds value and it answers your question – then the job isn't done."

>> wherever. How long will it take me?' And it says 'If you leave at 9 o'clock it will take you two hours and if you leave at 10 o'clock it will take you one hour, so leave at 10 o'clock.' There's some brilliant semantic type search, plus some real time data working together." It's worked so well in the US, Stoddart says, that it's something that Microsoft is looking to bring to the UK, too.

Sound and image search

Searching in future won't simply be about typing text into a box. As Google's Marissa Mayer wrote on her blog (tinyurl.com/6xb5jo): "Why can't I enter my query as a picture of the birds overhead and have the search engine identify what kind of bird it is? Why can't I capture a snippet of audio and have the search engine identify and analyse it?"

In fact, you already can. Well, sort of. If you're listening to music, you can call Shazam on 2580 (www.shazam.com) from your mobile phone, hold your phone to the speaker and have the track identified by text message. And Shazam apps for the iPhone and Android enable you to go a step further and buy the track, too.

Snaptell Explorer for iPhone lets you send a photo of a book, CD, DVD or game to the service where it will be identified, and you'll then get links to buy it and to Wikipedia and search engine results to learn more about the product. TinEye Mobile (ideeinc.com/products/tineyemobile) lets you buy music with your iPhone when you photograph and upload an album cover.

TinEye's Image Search Engine (tineye.com/login) lets you upload an image to find out whether it appears on the web anywhere. It's a great tool if you want to check your photos haven't been ripped off by copyright thieves, and it even finds partial matches that have been altered in an image-editing program.

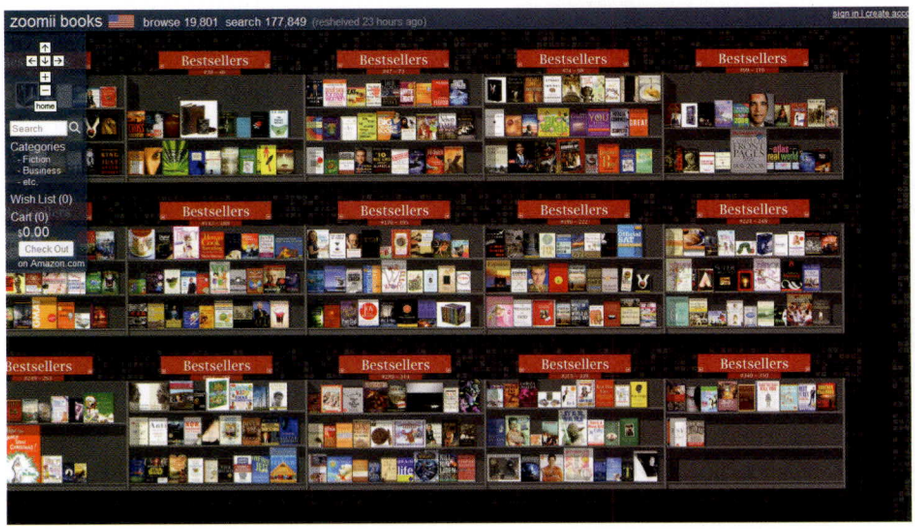
> "Wouldn't it be great if the search engine could hook up to your mobile and knew exactly where you were?" Paul Stoddart, Microsoft Live Search

Voice search is already possible via mobile phone or with speech recognition software on your PC, but how many people currently use it? "A small proportion of people are using voice and an even smaller proportion are using cameras to say 'Where am I?' or tagging photos, and it's hard to tell if that is the future," says Stoddart. "I've always been excited by things like music search – humming a song to my computer and it coming back to say 'This is the song you're thinking of and this is where you can buy it'. There are lots of different companies trying these things and I wouldn't rule any of them out for search engines in the future, but a lot of this gets dictated by the user. So if you were to build a search engine tomorrow featuring all the niche, bleeding-edge technologies, there's a high chance that no one would use it because they're just not used to it. So there's the whole transition from 'What do we have today?' to 'Where do we want to go in the future?' There will be things that the user pushes us to do and things that we push the user to do, and it's got to be a balance in between."

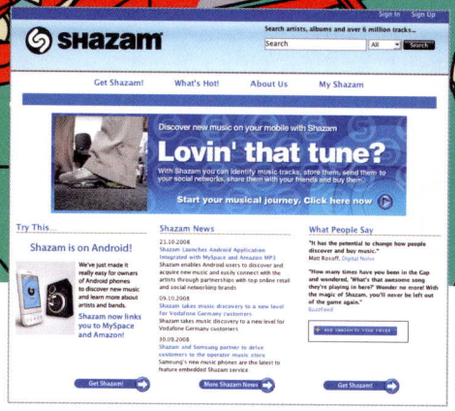
Video search

Another area we'll see increase in intelligence is image and video search. Galler says both have a lot of potential to improve. "You could say 'I'd like to see all the images where Paris Hilton is in them' or 'where there is a white horse', or a specific musical instrument, so you can define more object-specific searches, and that's going to improve over time."

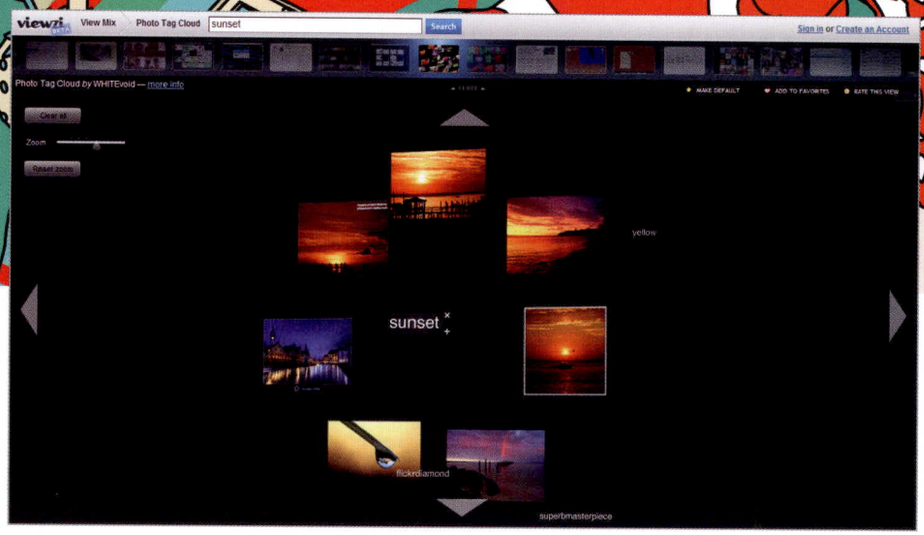
Galler predicts that video search will improve in the same way, so the user doesn't need to view the full set of videos to find the snippet they're looking



Cover story Zoomii (www.zoomii.com) presents search results on Amazon in the form of book cover thumbnails



Above Play a track into your mobile phone and Shazam (shazam.com) will identify it for you



Right Viewzi has a number of viewing options, including viewing results from Flickr as a photo thumbnail cloud

for. "Video search right now has a lot of potential to improve in what can be found in what part of what video, so the user doesn't really need to view the full set of videos to find what they're looking for," he explains.

"Day one of video search was going to a website, entering 'Friends' and getting all the different clips of *Friends*," says Goddart. "The next level was 'How do you make relevant results even more relevant?' If you look at Live Search you have an inline preview that allows you quickly identify whether it's the episode you're looking for because it picks out the key points throughout it – so now I don't have to watch the first four minutes of every episode of *Lost*."

The next stage, says Goddart, is where you can have the whole script indexed, so you enter your search query and it will bring back the relevant episode. "That's not going to be an easy thing to do, but if that's the way the user wants to search or we think that's the way we can give the best experience to the user, it's very likely that researchers will look into it."

Search gets personal

In May last year, SEO expert Mike Grehan wrote: "Search will gradually become more of a personalised experience. Personalisation and digital asset optimisation will end 1999-style ranking reports, as search engine results will be based on blended results from end-user specifics, such as geographic location, time of day, previous searching history, and peer group preference" (www.clickz.com/3629530). Marissa Mayer said it in less words in her blog post on the future of search: "Search engines of the future will be better in part because they will understand more about you, the individual user." Google's SearchWiki service is a step in this direction. Currently, SearchWiki enables the user to move results higher up the rankings, remove unwanted results, add missing results and leave public comments for other web users to view.

"SearchWiki is something that we're really interested in to allow users to really personalise their searches, and to give feedback to tell us what they think about the search ranking that we're doing," says Galler.

Are we going full circle, back to the days of Yahoo when results were compiled manually?

> "Your ability to say 'I'd like to see all the images where there is a white horse' will improve over time" Juergen Galler, Google

No, says Galler, although people can improve on computer results. "The internet is growing very fast and will be growing much faster in the future. The question really is, 'Can this massive growth be covered by just humans, or is it more efficient to have a computational process?'

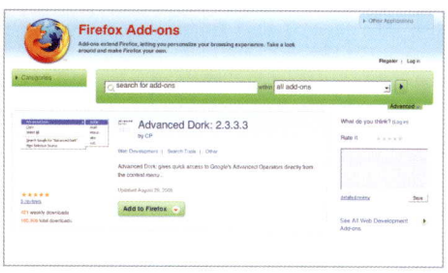
"Humans can improve specific aspects of that – that's partly what we do with SearchWiki. We don't need a human to go out and investigate something and come back and list it. What we do is, he enters the search and we provide a result. If he thinks he has a better site that we haven't ranked, he can include it. So having a computational back-end that scales with the internet allows you to generate a basis, and then humans can go in and say 'I like this site, I don't like that site, I can leave a comment on one or rank one higher'. So right now we do this for personal use, and I think that's the most important."

Stoddart agrees that, while computer-generated results are the most accurate, we shouldn't rule out a human element. "It might be a way of helping the algorithm learn quicker, but technology is an amazing thing. We take a different approach: we have a very algorithmic-based machine learning system. We've always said we believe the algorithmic way is the right way, because a computer will pick things up faster than a human will, especially when it comes to picking up patterns."

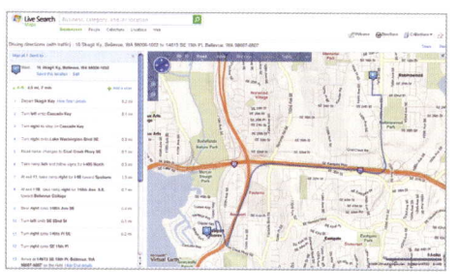
While search engines learn ever more detailed information about our search habits, which they can then use to refine future results, should they also incorporate the knowledge and preferences of our friends in the results?

It's massive privacy minefield, says Goddart. "There's a privacy issue there which we'd have to work through and say: what do you want your friends knowing about what you're doing, where you shop and where you don't shop?

"When will people be ready to share this information in the right way? People could jump into this and get into very scary situations very quickly. We're very socially aware and we'll do it when we have the right protocols and policies in place to make sure people get the best experience possible."



Dork delight Advanced Dork lets you highlight a keyword and search Google using advanced operators in Firefox



Above Live Maps in the US uses real-time traffic flow data to help you make the best travel choices possible

WWW. *What kind of search engine would make your life easier? Share your views at forum.netmag.co.uk.*

"Ten years ago I felt we had about a two per cent chance of succeeding. A lot was left to chance"

Marissa Mayer, Google

www.google.com

She's influenced almost every Google tool you've ever used. **Oliver Lindberg** talks to Marissa Mayer, Google's vice president of search products and user experience, about the company's past, present and future

Only Google's founders and CEO Eric Schmidt have more power. Pretty much every product that Google works on has to go through gatekeeper Marissa Mayer, who decides whether it's ready to be released or needs more work. She even approves every single Google Doodle that adorns the search giant's homepages around the world. From being hired as the first female engineer to becoming one of the key decision makers at Google, she's come a long way.

"We were very small, just 20 people," Mayer, now Google's vice president of search products and user experience, recalls of the early days. "There was a tremendous amount of energy, scruffy entrepreneurialism and a sense of hope. We really felt we were working on something that might change the world. We were all very excited to be working on such an important problem and we thought it would really have an impact. Even from that vantage point, though, it wasn't clear to us what type of impact it would have."

Mayer simply didn't anticipate that Google, which had just signed a deal to become Netscape's default search engine when she started, would turn into the biggest internet company in the world. "I actually felt that we had about a two per cent chance of succeeding. That might sound tiny, but actually that's about a hundred times higher than the average start-up. I thought that the odds relative to the other start-ups were very, very good – but even with those odds there was still a lot left to chance."

Chance, it seems, is something Mayer doesn't rate that highly. She's brainy, precise and ambitious, obsessive even, when it comes to shaping Google's product suite.

Critics, notably Silicon Valley gossip blog Valleywag, call her mechanical and robotic – and maybe she has to be to stay on top of it all. She looks after 150 product managers, and every month 10-12 major products are pitched to her. On top of that, 1,000-2,000 outside projects need to be reviewed. She has to make decisions all the time, and insiders call the rigid process of her critiquing and approving new features 'the Marissa Gauntlet'. Usually, each team has no more than 10 minutes to present their projects. During this time, though, they get her undivided attention – she won't check her email or take phone calls.

Aside from the official meetings, Mayer's office door is open for an hour each day, so Googlers can go in, ask questions and get more advice on a project. Of course, as her job title suggests, the focus is on the user experience. She's absolutely devoted to the needs of the 'end user' and often uses her mom as a reference point to check whether an idea is simple enough.

But what other criteria does she take into account when she decides whether a product is a goer? "I look for the insight and innovation that's baked into the idea," Mayer explains. "I also look at the overall energy and strength of the team that's presenting it. Then I develop an overall sense of confidence that it's both a good product idea and that we have a good team who are interested in moving it forward. If those two things come into alignment, it's going to be a successful product."

Innovation is her real passion (along with cakes – she's actually invested in a speciality cake company called I Dream Of Cake). She uses her '20 per cent time' (the time Google apportions its employees for personal projects) to figure out how the search giant can continue to innovate as it builds new products.

The future of search

As the self-proclaimed search addict points out, there's still a lot of opportunity for innovation, change and progress in search. Although typically tight-lipped about future products, she does hint at the direction Google is going to take. "We think it's really important to move beyond just keywords and allow people to ask questions, and maybe access things more easily from their mobile phone," she says. "We're also looking at how to weave new media into it and how we can bring books, videos and news right into the search experience. And then there are various pieces of personalisation."

To celebrate Google's 10th birthday Mayer laid down her thoughts on the future of search in a blog post (googleblog.blogspot.com/2008/09/future-of-search.html). She believes that, while search is 90 per cent solved, the last >>

"It's really important to move beyond just keywords; to allow people to ask real questions and access things more easily from their mobile phone"

Gatekeeper: Almost every product developed by Google has to go through the 'Marissa gauntlet'

"When I started at Google there was a tremendous amount of energy, scruffy entrepreneurialism and sense of hope"

Photography/Sandra Silbereisen

>> 10 per cent will take decades to complete. She compares search to biology and physics in the 1500s or 1600s and claims the famous 10 blue links of the Google search page are just the beginning. Universal search, which adds images, videos, news, books and maps to the search results, is a first step in the right direction. Mayer reveals that the team has been evolving the interface design and user experience of the rich media-heavy search results since the launch in May 2007 and that we'll see the fruits of this experimentation in the coming months.

Mayer also believes that personalisation – "What can we understand about the user and how can we tailor the results to them?" – will be an important part of search. Search engines will be better because they'll understand more about the user. "Maybe the search engine of the future will know where you're located," Mayer suggests. "Maybe they'll know what you know already, or what you learned earlier today. Or maybe they'll fully understand your preferences because you've chosen to share that information with us. We aren't sure which personal signals will be most valuable, but we're investing in research and experimentation on personalised search now because we think this will be very important later."

The social aspect plays a significant part, too. Mayer explains: "We really need to harness people's friends better to understand which news to direct them to, which local events to direct them to... these are all things that we think are intriguing."

Mayer describes the concept of the ideal search engine as "Your best friend with instant access to all the world's facts and a photographic memory you've seen and know." To some that might seem scary: however, she claims a user's privacy is respected by a good user experience that really embodies transparency and control. In Google's personalised search, for example, you can already see your web history and remove items if you wish.

Google will also continue to focus on cloud computing, the idea that you can store some of your information on the web. "It's actually better replicated and better cared for than if you have just a single copy of that data on your laptop," she enthuses. "That's really exciting. It would be very good for consumers to actually start using some of the server farms that many of the big internet companies have been building to store their data more reliably. It allows you to free yourself up. You're not married to a computer, you can access your data from anywhere. How you use the cloud is completely dependent on you. You can decide to put all of your data in the cloud or you can decide to put very little of your data in the cloud – it's your choice." For example, you might want to store your own medical records at Google Health and access them from anywhere there's internet access.

Last year Mayer celebrated her own 10th anniversary at Google but for now has no intention of leaving. "I'm a geek and Google is a great place for geeks," she says. "I love my job because I get to work on new problems and have new challenges each day. I'm currently working on our Geo products, Google Book Search and Google Health. They're all things I'm excited to be part of."

Marissa Mayer

Job Vice president of search products and user experience
Company Google
Age 34
Education BS in Symbolic Systems and MS in Computer Science from Stanford University (speciality: artificial intelligence)
Previous career Worked at the UBS research lab (Ubilab) in Zurich, Switzerland, and at SRI International in California

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/Google/search engine indexing

What's the best way to capitalise on how search engines index? How can you make sure that users find your site? Google's Dan Crow has the answers

Knowledge needed HTML, XML

Requires A text editor

Project time 20 minutes

For users, Google's web search is nothing but a nice, simple search box: you type in your query and get back the pages you're looking for. Behind the scenes, however, making web search work is rather more complicated, and it's getting increasingly difficult as more information becomes available online. At Google, we're constantly trying to help people find the information they're looking for quickly and easily. Over the past five years, Google web search has become much faster, and our crawling and indexing systems have become more intelligent.

This is great news for webmasters, as it means that we're interacting with their content in more efficient and effective ways than ever before. For example, our indexing systems know that the pages on a newspaper's website update frequently and need to be crawled more frequently. Likewise, we can now detect sites that have an infinite set of pages, such as online calendars, which provide little value to users but slow down our crawler and swamp the site with crawl requests.

Improve the visibility of your site

How to enhance visibility is a question we're often asked, and Webmaster Central (google.com/webmasters) is a great resource for finding the answer. First, make sure that Google can find and index your website. You can use the tools available at Webmaster Central to determine whether your site is currently included in Google's index, and whether we received errors when we tried to crawl it.

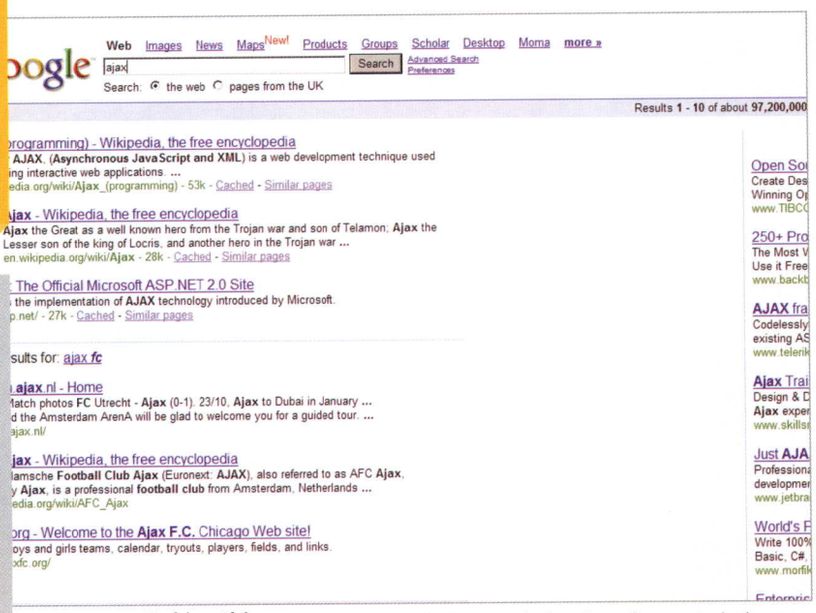
Occasionally, a webmaster will discover that his or her site isn't appearing in search results. It could be because the Googlebot couldn't find your site if it was temporarily down when we tried to crawl it, if it was only posted after we crawled, or if there aren't many inbound links from other sites. It could also be a result of our crawler being unable to make a copy of your pages for inclusion in our search results.

Sometimes, it's the structure or content of a particular page that prevents it being left out of our search results. Dynamic content – dynamically generated URLs, Flash, JavaScript and some types of frames – are not easily indexed by search engines. A page that requires users to complete a form in order to see content presents a similar problem. To get a better idea of how our crawlers see your site, disable images, Flash and JavaScript in your web browser and visit your site.

Other more general issues can affect our ability to index your website, too. If your site's URLs include several parameters or session IDs, or if URLs include frequent redirects, we may not be able to index that site.

Control your content

Every website owner has a different goal for his or her site. Some newspapers, for example, make all of their articles freely available online for all internet users to read and access. Others choose to keep some or all of their content behind a subscription service. Some webmasters want their content to be



Making things easy Caching and snippets make it easier to figure out whether your website will meet people's needs (see the expert tip on the right for more on this)

Expert tip Controlling caching and snippets

Google search results usually include a snippet and a cached link. The snippet is an extract of the page showing the words the user searched for. The cached link takes users to a copy of the pages stored on Google's servers.

Users find these features of search results extremely useful. If your site is temporarily unavailable for some reason, they can still access your content through the cached link. Also, the cached copy of your page highlights the words from the user's search query, which can help in locating the relevant section of the page. Snippets make it easier for users to assess the relevance of your site to a particular query. Google's research shows that users are much more likely to click on a search result that has a relevant snippet.

Most sites want search results linking to their pages to include both a cached link and a snippet, but you can also use meta tags to disable one or both. To prevent a cached link from appearing in search results, use:

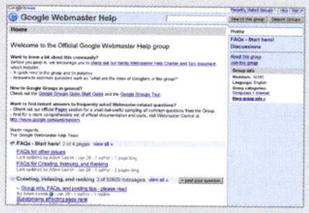
```
<META NAME="GOOGLEBOT" CONTENT="NOARCHIVE">
```

Similarly, you can tell Google not to display a snippet, which will also prevent a cached link from being shown:

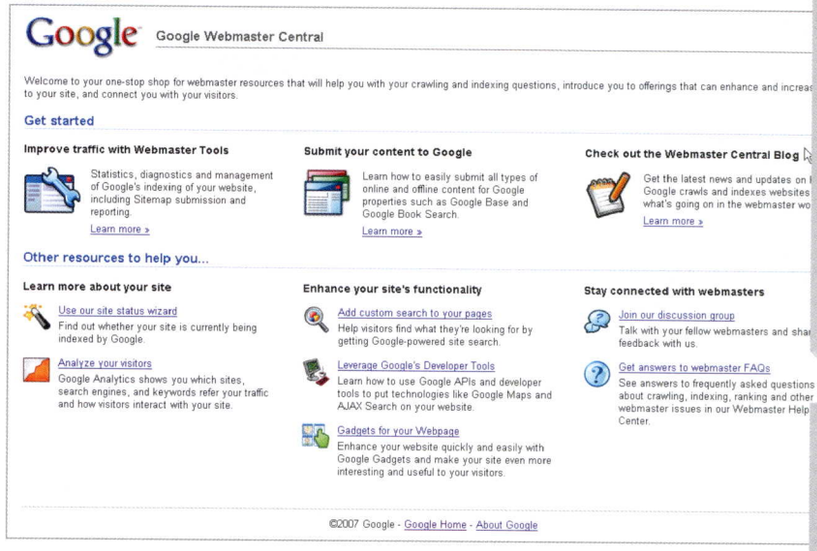
```
<META NAME="GOOGLEBOT" CONTENT="NOSNIPPET">
```

Resources Find out more online

Google Analytics
Google Analytics is a free tool that can help you learn more about where your visitors come from and how they interact with your site. Easy to use but offering sophisticated analytics tools, it can help you to make better-informed decisions about how to control your site's content.
www.google.com/analytics



Webmaster Help Group
This is a useful, collaborative corner of the web, where you'll find answers from expert users and even Google employees. If your specific issue or question isn't answered there already, you can post it and let the various experts weigh in.
groups.google.com/group/google_webmaster_help



Google does it again Webmaster Central (www.google.com/webmasters) answers crawling, indexing and ranking questions, and provides a range of diagnostic tools

available through a variety of search services – mobile, image search, and so on – while others only want to be found in web search results.

The good news is there are tools available that will let you make as much or as little of your content as you like available to search engines. These range from site-wide control specified in the 'robots.txt' file to using meta tags to control how individual pages are indexed. Like other search engines, Google respects webmasters' wishes about how we use their content. By using the tools currently available – including some recently improved features – website owners can build these automated-access controls into their site, which can help potential visitors find the best of a site's content quickly and easily through the right channels.

Using 'robots.txt'

The Robots Exclusion Protocol is a well-established tool for specifying site-wide access restrictions. The first part of the protocol is the 'robots.txt' file, which is a plain text file that you place in the root directory of your website. This contains simple rules which inform crawlers how they can access your site at various levels, from the entire site to individual directories, specific types of pages, and even individual pages.

Of course, most site owners want Google to index their sites, but there may be individual files or directories that you don't want appearing in search results, such as internal logs or subscription-only content. The 'robots.txt' file lists the pages that search engines shouldn't index. For example, if you want to stop the Googlebot from indexing your internal logs directory, your 'robots.txt' file should include this:

```
User-agent: Googlebot
Disallow: /logs/
```

The line beginning **User-agent:** specifies that the following section is a set of rules specifically for Googlebot (the name of Google's main web crawler). The **Disallow:** line instructs Googlebot not to access files in the logs subdirectory of your website.

All major search engines will read and obey the instructions you put in your 'robots.txt' file, and you can specify different rules for different search engines. You can also control how certain types of file are handled by search engines. For example, if you wanted to make sure that the images on your site are not included in all search engine results, you would include the following lines in your 'robots.txt' file:

All major search engines will read and obey the instructions you put in your 'robots.txt' file

```
User-agent: *
Disallow: /*.jpg$
Disallow: /*.jpeg$
```

The line **User-agent: *** specifies that the following rules apply to all search engines. The two disallow rules instruct the crawlers to ignore any file ending in either .jpg or .jpeg.

Working with meta tags

The second part of the Robots Exclusion Protocol are the robots meta tags. These offer you fine-detailed control of how an individual document is indexed. The meta tags are particularly useful if you have permission to edit individual files but not the site-wide 'robots.txt' file. You can place one or more meta tags inside the HTML of a page to specify the search engine behaviour for that page.

For example, let's say you have a news article on your site that should only be accessible to registered users. You can add a **noindex** meta tag to the **head** section of the HTML, which will stop Google indexing the file:

```
<html>
<head>
<meta name="googlebot" content="noindex">
</head>
```

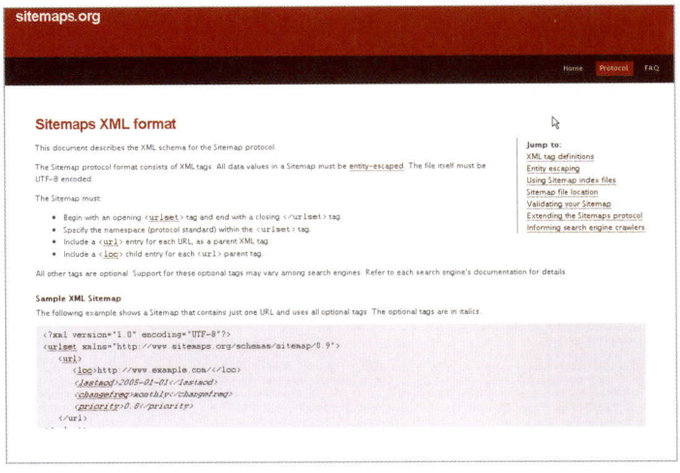
Of course, in many cases you'll actually want Google to index this type of page so that users can search for it, even if they will have to pay a fee to read the content itself.

You can also target all search engines using the **robots** meta tags. For example, if you wanted all search engines to ignore a particular blog post on your website, there's an easy way to do this: you would add the following meta tag to the **head** section of the post's HTML:

```
<meta name="robots" content="noindex">
```

The advantages of sitemaps

In order for Google to include pages from your site in our index, we need to know the URLs of all those pages. Generally, Googlebot will find your pages by crawling your website and reading the links from one page to locate others. Some sites have "walled gardens", which are simply pages that aren't linked from anywhere. Because Googlebot locates your pages by following links to them, it won't be able to crawl and index pages in a walled garden. To overcome this issue, you can supply Google with a list of all the URLs >>



Mapping mayhem You can learn more about sitemaps, and how they can help to inform search engines about pages, at Sitemaps (www.sitemaps.org)

The new unavailable_after meta tag tells Google that a page expires on a specific date

>> on your site to ensure that we know about them all. You give us this list in the form of a detailed sitemap.

Google first developed the Sitemaps Protocol in 2005, and we have since worked with other major search engines – including Windows Live and Yahoo – to make its functionality more useful to webmasters by making sitemaps an open standard. Sitemaps complement existing web-crawling mechanisms, allowing webmasters to tell search engines about the pages on their site, which can improve the crawling and visibility of their pages in search results. Here's what an XML sitemap looks like:

```
<?xml version="1.0" encoding="UTF-8"?>
<urlset xmlns="http://www.sitemaps.org/schemas/sitemap/0.9">
  <url>
    <loc>http://www.example.com/</loc>
    <lastmod>2005-01-01</lastmod>
    <changefreq>monthly</changefreq>
    <priority>0.8</priority>
  </url>
</urlset>
```

Even greater control

Let's return to the Robots Exclusion Protocol. Why? Because Google has recently introduced some new features to it that give you even more control over how your content is indexed. The first of these features is the new **unavailable_after** meta tag. This allows you to tell Google that a page expires on a specific date. After that date passes, Google will remove the page from its index. Sometimes you know in advance that a page is going to expire in the future. Maybe you have a temporary page that will be removed at the end of the month, or perhaps some pages are available free for a week, but after that you put them into an archive that users must pay to access. Here's how you would specify that a page will expire on 10 November 2010:

```
<meta name="googlebot" content="unavailable_after: 10-Nov-2010 12:00:00 EST">
```

The second new feature allows you to add **robots** meta tags to any type of file. The meta tags are useful, but until now they could only be added to HTML pages. What if you wanted to tell Google that a PDF file shouldn't be indexed, or a JPEG file won't be available after a certain date? Now you can add **robots** meta tags to the HTTP headers served with any file. You need to update your web server to add the new **X-Robots-Tag** to the HTTP headers served with the files you wish to control. For example, to make sure that a particular image file is not indexed, include the following HTTP header when it's served:

```
X-Robots-Tag: noindex
```

If you put all this into practice, you should find that more users are finding the right parts of your site. Good luck!

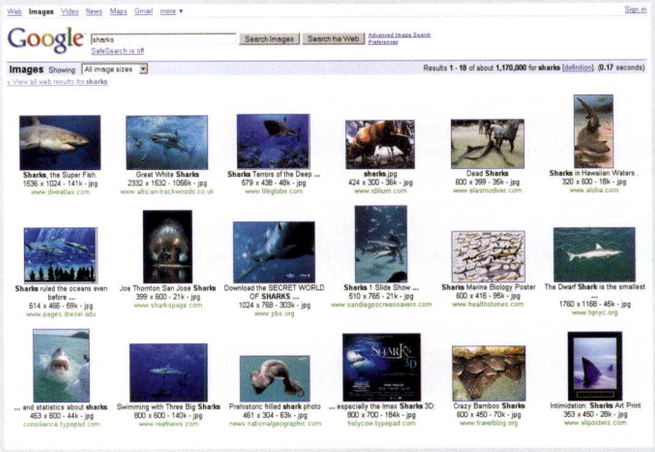
Expert tip Increasing visibility

Many site owners fixate on how well their web pages rank, but ranking is determined by over 200 criteria in addition to PageRank. It's much better to spend your time focusing on the quality of your content and its accessibility, rather than trying to find ways to "game" a search engine's algorithm. If a site doesn't meet Google's quality guidelines, it may be blocked from the index. When in doubt, consult our webmaster guidelines, available at www.google.com/webmasters/guidelines.html.

Image search

Not using Google's dedicated image search?

Google offers a number of specific search services beyond the basic web search, but not everyone realises this. For example, you can use image search to look for pictures on the web, as I've done below for "sharks":



But what if privacy is an issue, and you don't want the images on your website popping up in search results? Fortunately, you can keep images out of Google's image search using the Robots Exclusion Protocol. Add a 'robots.txt' section targeted at **Googlebot-Image**, which is the name of the crawler for image search. The following section will safely prevent images on your site from appearing:

```
User-agent: Googlebot-Image
Disallow: *
```

You can also exclude individual images using the **noindex** meta tag:

```
<meta name="googlebot-image" content="noindex">
```

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Areas of expertise Crawling and indexing the web
For Christmas, I'd like ... A proper Christmas pudding!

Rebecca Appleton on...

The seven sins of SEO

Rebecca Appleton of search engine optimisation agency, Top Position, explains what not to do on your way to that number one ranking

A well optimised website with rankings on prominent search engines (think Google and Yahoo) is the holy grail of internet marketing. But how do you go about the process of search engine optimisation? Whether you want to optimise your own website or appoint a specialist SEO agency to do the hard work for you, it's a road paved with pitfalls, false hope and plain lack of direction.

Sometimes what you do wrong is every bit as important as what you do right. Make sure your search engine optimisation gets off on the right foot (and stays on the straight and narrow) by avoiding these seven SEO sins.

1 Putting search engines before users

Optimisation is the process your website undergoes in order to help it achieve the best possible listings. The reason for hankering after a number one ranking? To attract targeted traffic. It's therefore surprising how many websites forget about their human users in the quest for search engine success.

Cramming as many keywords as possible into each page may yield short-term SEO results but is guaranteed to turn off human eyes. Well-written content is much more likely to result in a sale and win over the search engine web bots.

> "Well-written content is far more likely to win over the search engine web bots" Rebecca Appleton

2 Link spamming

Link spamming sees the website chasing after as many links as possible, often using spurious excuses to answer forum questions or social media discussions in order to build external links. The reality here is that the links gathered are of little relevant use and no commercial value. Search engines rate links based on the authority of the sites they come from, so using link-spamming techniques actually devalues the site's authority.

A much better policy is to use time that would have been spent harvesting poor quality links for a more strategic campaign. By focusing link-building efforts on relevant sites, optimisation activities will also target the desired demographic.

3 Disregarding link text

The anchor text of the link should be written as carefully as possible. Search engines such as Google can use anchor text as an indicator of internal links (links from one page of the site to another). Unimaginative anchor text such as 'click here' also does little to add value to the user experience.

4 Not tracking progress

It's impossible to assess just how effective SEO activity is if there's no record of the starting point. Tracking is an often forgotten stage of SEO, with many people thinking the best measure of progress is simply improved organic listings. Not so. The number of sales and new search inclusions are all-important metrics indicating the success (or otherwise) of the SEO strategy. A reliable and regular report detailing these factors can be used to decide on any necessary changes in direction and assess the impact of such new activity.

5 Choosing the wrong keywords

Some SEO companies propose guaranteed listings for obscure keywords, showing just how easy it is to generate page one rankings for terms with little competition. But keywords involving product names and numbers are of little use in a strategic optimisation programme. Optimisation for 'flatscreen TV' would be a good goal for a company selling flatscreen TVs. Optimisation for 'Sony Flat Screen AB 123356BBBB' would not.

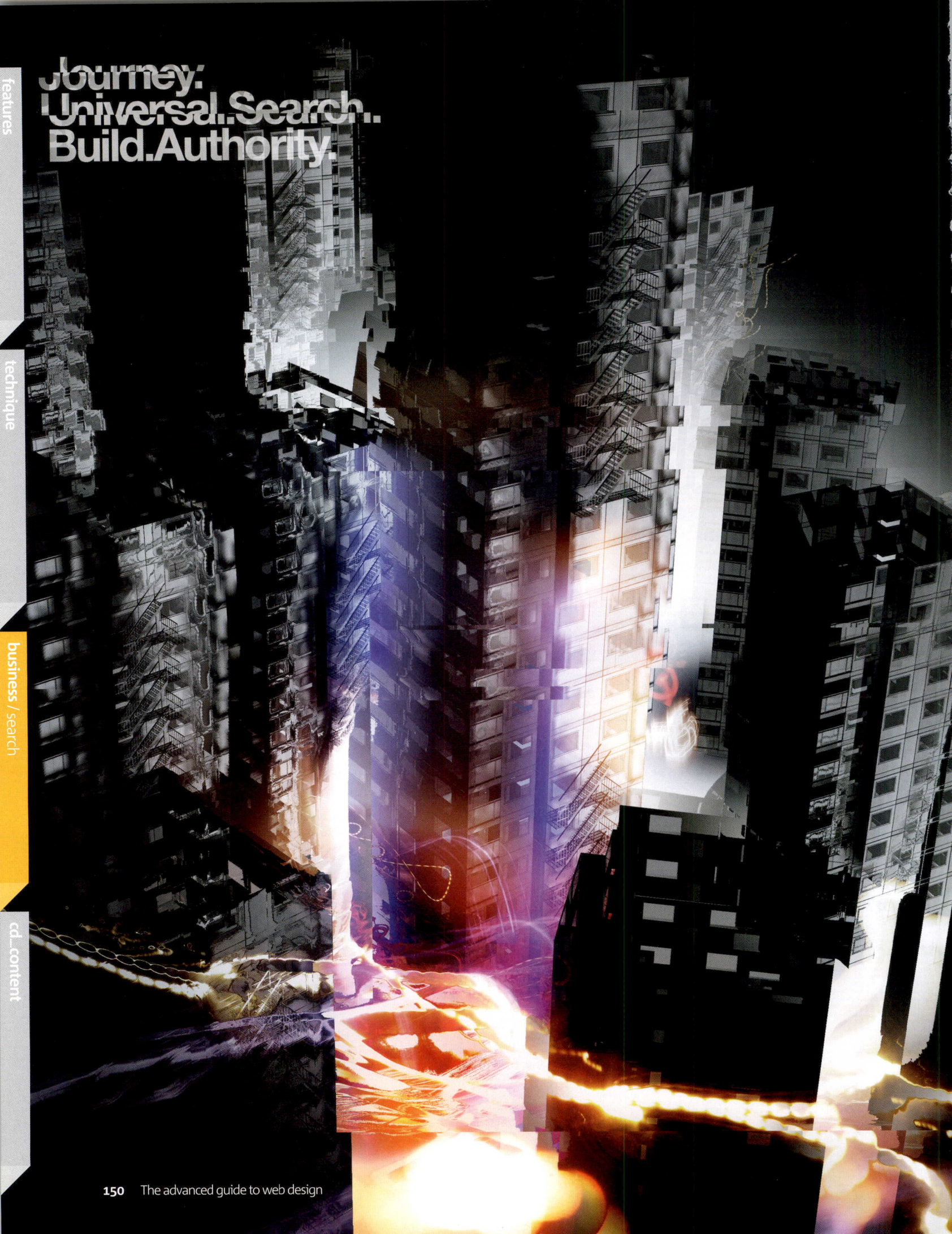
6 Overlooking accessibility

Website accessibility is a critical consideration – making your website navigable to all users regardless of disability or visual impairment. The Disability Discrimination Act 2004 is an essential guideline for any UK-based website. Making link text as descriptive as possible is a part of this, but accessibility goes much further with actions such as introducing relevant Alt and Title tags compliant with WC3 guidelines.

7 Not planning your SEO strategy

Planning a useful campaign is very much like planning a journey. One of the common mistakes made by newcomers is to be overtaken by enthusiasm and neglect to map out points of interest along the way. Rather than focusing on the end goal, set short-term objectives that are signposts towards the elusive page one ranking.

Rebecca Appleton is operations director of SEO agency Top Position (www.topposition.co.uk).


Journey.
Universal.Search..
Build.Authority.

Advanced SEO tips

Improve your site's SEO for search engines, new social media, universal search, the semantic web and more! **Gary Reid** of the Search Works has the lowdown on how to raise your rankings

Words **Gary Reid** is director of search performance at leading search marketing agency The Search Works
www.garyreid.co.uk

Image **The Ronin**
Rob Chiu's motion graphics and design studio
www.theronin.co.uk

Tag: seo184 >
For all links from this feature, visit:
delicious.com/netmag/seo184

Getting your SEO campaign right can be the difference between failure and success for your site. Being the first listing on Google can get as many as 55 per cent of all people who search for that term clicking on your link. Put simply, SEO works. It's simple, cost effective and delivers long-term efficiencies. You just need to make sure it works for you.

However, in the fast-changing web landscape of today, it's becoming more and more of a challenge. The way people are using the web is changing fast, and your approach to SEO needs to keep pace for your site to succeed. Over the next few pages, we'll show you just how you can do that.

The new web order of sophisticated users mixing their online and offline lives into thousands of simultaneous conversations – using Facebook to communicate, Twitter to share their daily routine, Flickr to post their photos, and so on – means we need to plan our SEO campaign using a strategy that ensures we work smart, get indexed, be relevant, build authority and 'join the conversation'. We'll share a few simple ideas you can deploy tomorrow morning to get you into the race. We'll look at how to plan an SEO campaign, implement it, track results and tweak the campaign to constantly keep pace with what's happening on the web.

The world of SEO is becoming more and more sophisticated. In a game of cat and mouse, the engines strive to limit spam and deliver relevant results in return for a few keywords, while so-called black hat SEO consultants, those who use unethical practices to gain top results, look to exploit the system. The rewards are so high that even big business will risk all to get to the top of search results. A simple, professional approach to SEO can bring thousands of qualified visitors to your site, boost your income and make a real impact on your bottom line. So where do you start?

Work smart

The first thing you need to do is think about the journey your users take, from start to finish. At every stage of their journey, users enter different kinds of search query. These can be divided into three basic types.

The first is the navigational search: a query that includes your brand name, domain name or company name (for example: 'Sony Erikkson'). The second is the informational search, where the user enters highly generic phrases ('holiday in Spain'). Finally, the third type of search query is the transactional search: usually three-, four- or five-word phrases that exactly identify what a user wants. Each type of search query is relevant at different parts of the user's journey, from >>

business search

Hot trends Universal search

Universal search is growing in importance, mixing results from various Google properties into one blended search results page. But it can play havoc with natural listings if you haven't got to grips with what you need to do. Follow our advice to get first-page listings for keywords where the competition is tough.

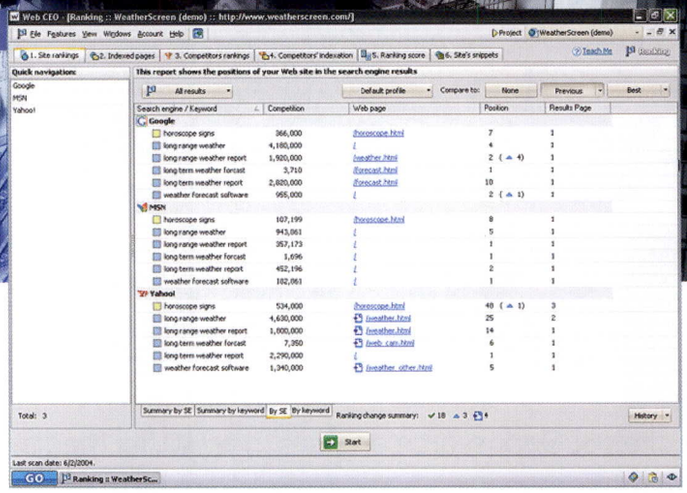
1 Use Google Base
Google Base is where you can list almost anything, from your personal profile to property to products you sell. Triggered by relevance, keywords in your product title and description, Google will blend Base results into search results if it can find a match to the search query. Listing your products is simple, either one by one, using an XML feed or using Google's API. Sign up for a Google Base account and take advantage of some free positions for top generic keywords.

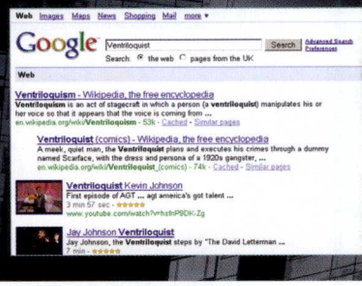
2 Make use of Google Local
Google uses location as a trigger to include maps showing local businesses at the top of organic search listings. All you need to get in these results is an entry in Google's Local Business centre. This will then be included when a search query includes either your brand term and a location, or a generic locational phrase, such as 'hotels London'. The map generated takes up a huge amount of screen space, pushing down the other results and leaving you in first position.

3 Use video to grab attention
With an optimisation strategy for videos hosted on YouTube or Google Video, you can trigger the inclusion of a video thumbnail in search results. These are a striking change to normal results and increase the number of users who'll click through. The key to grabbing a thumbnail is to use Google's Webmaster Tools to add a video site map to your site, which enables you to optimise the terms that cause your site to appear.

4 Optimise your images
Google Image Search has brought a whole new dimension to web search. Ensuring you have optimised images on your website offers the opportunity to gain first position in web results when the search term includes 'image' or 'images'.

5 Blog Search and Google News
Getting your content into Google Blog Search and Google News doesn't require you to have a blog or a big news site. An RSS feed is all you need to tell Google Blog Search you have fresh content, which you can create manually or via webrss.com. To get into Google News, you'll need to distribute your press releases to a site that's part of the system, such as PRWeb (prweb.com).





Above Nowadays Google blends many different kinds of results into its organic search listings

Left SEO software such as Web CEO (webceo.com) can help you analyse and improve your performance

>> initial research to shopping around and finally to selection and purchasing. The key to SEO success is to ensure you have visibility at each point of the user's journey, so understanding the sections of the journey is essential. Blindly optimising for a set of keywords you think is appropriate is a quick way to waste time and money. You really need to work smart to get the best from your efforts.

Think about the user journey for your site and select keywords that ensure you have a presence at every stage. Just because users who buy from you do a navigational search right before they purchase doesn't mean you should undervalue the influence other keywords have in the journey.

For example, let's say you sell handbags and you see everyone who buys arrives at point of purchase using your company name. However, the journey may have started weeks earlier, probably with an informational search, like the one shown at the top of the opposite page.

Get indexed

Once you're happy with your keywords and overall content in the light of a user's journey, you need to start thinking about getting your site indexed by the big search engines. The chances are you won't have as many pages indexed as you think, but thankfully the rules are fairly simple.

First, you need to make sure they're able to crawl your pages. Search engine spiders favour a few simple things:

- Clean XHTML or HTML code
- A lack of on-page JavaScript (put it in an external file and use an include call)
- An absence of inline CSS styles: put them in an external CSS file instead
- Non-dynamic URL paths

The most troublesome of these four is the dynamic URL paths. Many shopping carts and content management systems use dynamic URL paths such as domain.com/=3888&colour=56. All the current search spiders prefer URL paths that are static, so this could be changed to domain.com/product-3888/colour-56. If you want to be extra SEO-friendly you could use URL paths such as domain.com/go-karts/red (see our mod.rewrite tutorial at www.netmag.co.uk/files/mod.pdf).

Submit a site map

So, you've cleaned up your code, removed the JavaScript and inline CSS styles and made your URL paths SEO friendly. What next?

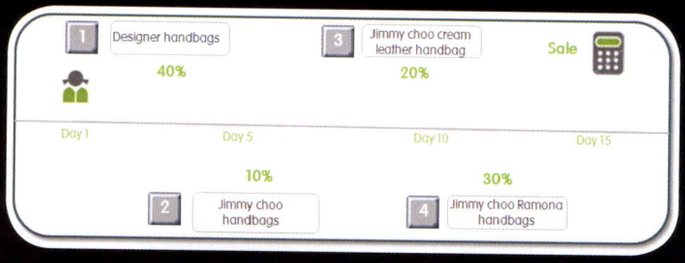
In the early history of the web, you had to wait for the search engines to visit your site and index it for you. Happily, those days are gone. You can now post a special XML site map file, which contains details of your site, so the engines know exactly what they have to crawl. Head over to gsitecrawler.com to create a free XML map of your whole site.

Once you have a complete site map available, you'll need to upload it to the top-level folder on your domain (domain.com/sitemap.xml) and inform the search engines where it resides.

There are three ways to do this. The first is to upload a 'robots.txt' file to your top-level folder on your domain and add a line of code that alerts the spiders to the location of your site map. This code should look similar to: sitemap: http://www.example.com/sitemap.xml. Now all the major search engines will be able to find your site map. If you can't get a 'robots.txt' file, or don't want to take that approach, you can inform the engines by sending them a 'ping' letting them know you have a site map and where it is. Each engine has a special URL to send these pings to: just change the URL to suit your domain and then browse to it. For Google you need www.google.com/webmasters/sitemaps/ping?sitemap=http:%3A//www.domain.com/sitemap.xml while for Yahoo you need search.yahooapis.com/SiteExplorerService/V1/updateNotification?appid=YahooDemo&url=http://www.domain.com/sitemap.xml.

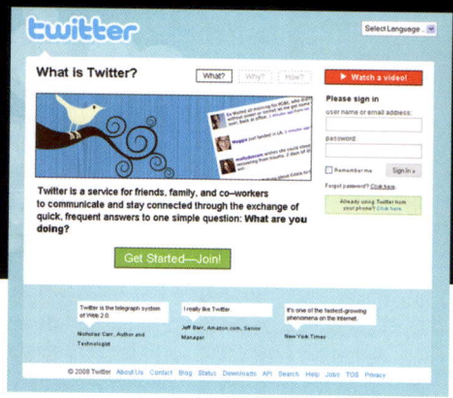
> You can now post an XML site map file so the engines know exactly what they have to crawl

Finally you can use each of the engine's webmaster portals to add a site map manually.



Right The timeline shows the routes a user takes before they make a final purchase – you need to optimise your keywords for all stages of their journey

Far right Social networking sites have created untold opportunities from an SEO standpoint – although they're often abused



The URLs for each service are: www.google.com/webmasters/tools/, https://siteexplorer.search.yahoo.com/ and webmaster.live.com/. Signing up for an account with all three is a really good idea as it will enable you to track and monitor both indexed pages and any problems with your site.

Once you've started to get your pages indexed, you're well on the way to getting your SEO on track. The next step is to ensure you start to get high rankings in the search results pages for the keywords that will drive traffic to your site. This means making your site relevant.

Too many people get fixated on proximity, density and prominence

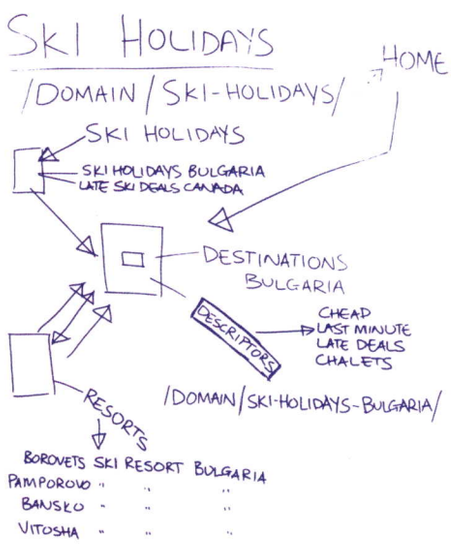
Be relevant

Search engines aren't capable of thought, they just follow a set of rules laid down in an algorithm. Just because a human can work out what your website is about doesn't mean a search engine can. Creating a page that pushes every algorithm button may get you some good rankings, but humans would probably find it a fairly awful experience to browse.

This presents us with a real dilemma when optimising our content and a good rule of thumb for this situation is put humans first. After all, having tons of traffic from high-ranking keywords to an awful site equals disaster.

At the start we outlined how we need to work smart by finding a set of keywords and phrases that will drive qualified traffic to our site at all the stages of the user journey. Now we need to take those keywords and match them to the pages on our website. If we have keywords and no content then we need to create it. It's a good rule of thumb to optimise each page with one main keyword, maybe a generic phrase like 'digital camera', and also for some niche or longtail keywords such as 'best value digital camera'.

How do we make the page relevant for these keywords? The first step is to dive into the code of the page, or meta title to be precise. This is the piece of code that lets the search engine know what the main subject of the page is (it's shown to humans in the very top of the browser).



Break it down There are a number of factors you'll need to consider in order to get the most from your keywords. Don't just write down a few that 'seem good'

Sometimes you'll see titles that have keywords repeated. This is because many people get fixated on three key elements of optimisation, namely proximity, density and prominence.

Placing keywords close together and excluding common language makes keyword proximity better – for example 'Holidays Spain' instead of 'Holidays in Spain'. Next on the over-the-top hit list is density. You may hear all kinds of 'rules' about this, from 10 per cent density of keywords to 20 per cent density, but trying to place keywords unnaturally into a page makes it a really bad experience for humans and risks search engines thinking the page is just spam. Finally, you'll see pages where the meta title, page heading and initial text are stuffed full of keywords to try and make them more prominent on the page. The truth is, it's rare that you'll ever need to go this far.

It's better to write naturally. In the head section of your HTML you'll find >>

Case study The British Red Cross

In 2007, the British Red Cross engaged The Search Works (www.thesearchworks.com) on a consultancy basis to improve its presence within the natural search engine listings. The initial engagement consisted of six months of support with specific projects and deliverables, after which the relationship was extended to include an array of SEO training.

The key objectives for the British Red Cross were to drive more natural, unpaid traffic to its website; to improve its search friendliness; and to increase the number of site pages being indexed by search engines.

The Search Works began the project with a full site audit, which uncovered all of the technical aspects of the site that were preventing search engine access.

The agency recommended the site be optimised for better access, and liaised with the organisation's site design agency for implementation. Additionally, it trained key content creators to optimise site copy and provided monthly analytic reports.

As a result of this site audit and the appropriate recommendations, between June 2007 and June 2008, traffic from search engines increased by 71 per cent across the major engines, and donations from natural search results increased by 106 per cent.

- **Navigation and page structure were improved, including a change from JavaScript menus to more accessible CSS-based implementation**
- **The URLs were simplified and any parameters that were creating duplicate content issues were removed**
- **Site mapping was improved for both search engine access and usability**
- **On-page factors such as internal linking, page structure, title and meta descriptions, keyword use and calls to action were included throughout the site**
- **Ideas for new content, link building and social media that could benefit search engine optimisation were included within the audit**

Hot trends Five things you must do to improve SEO

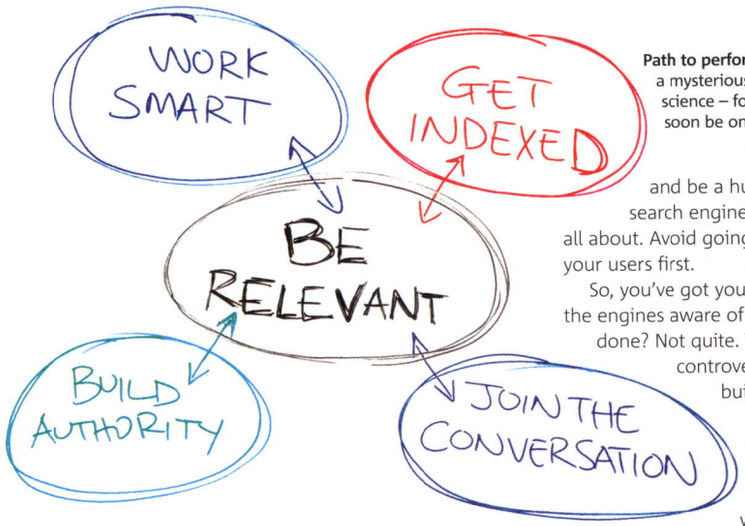
1 In the current economic climate, people's search patterns are likely to shift to searching for bargains and wanting to make sure they're getting the best deals and recommended products. It's likely you'll want to change your keyword strategy to include the basic qualifiers users will add to their search queries, such as 'cheap', 'bargain' and 'deals'.

2 Local search will become a necessity, especially for firms with a bricks and mortar presence. The adoption of high-end mobile phones with broadband and built-in GPS will mean people start using Google Maps to search for businesses close to their current location. Make sure you fully utilise Google Local Business Center to take advantage.

3 Vertical search and social media will continue to gain ground as search starts to trickle away from traditional search engines such as Google, Yahoo and MSN towards social networking sites such as Facebook, MySpace, Twitter, LinkedIn, as well as selective niche portals such as Farecast (farecast.live.com) and Kosmix (www.kosmix.com).

4 Link building will get even more difficult as the major search engines improve the way they can spot paid links. As commercial pressure increases, more and more webmasters will start to take advantage of Google's spam and paid link reporting system in Webmaster Tools (google.com/webmasters/tools).

5 Integration with all media will become essential and more sophisticated as lessons are learned from the big brands' experiences of asking people to search online for specific keywords. More than anything else, small and medium-size businesses will need to dominate search results for their brand terms to gain visits and to manage their online reputation.



Path to performance Search optimisation isn't a mysterious dark art but a straightforward science – follow these simple steps and you'll soon be on the road to higher rankings

this code: **<title>Home - .net magazine</title>**. This meta title is probably the most important change you can make. The first thing you need to do is make sure every page has a unique meta title. Then make sure the meta title follows a simple principle: **<title>Primary Page Keyword | call to action | brand</title>**. This makes the title relevant to search engines while still providing a good user experience.

Next, consider content. It's essential to structure your content using HTML heading tags H1, H2 and H3 as well as having 100-400 words of content. Add your primary keyword to your H1 heading somewhere in the first sentence on the page. Then write the rest of the headings and content naturally while considering how you can work in the other, niche/longtail keywords.

Finally, think holistically. Internal linking using the correct anchor text is a simple way of both passing users to relevant pages and letting the search engines know what the pages are about. Search engines put a great deal of significance on the text used to link to other pages; it's like telling the engines exactly what the page is about. So avoid links like 'read more' and start using keywords in these links.

Go through every page on your site and make sure that it's relevant to the keywords that will drive traffic. This will increase the user's experience and be a huge step towards letting search engines know what the page is all about. Avoid going over the top: always put your users first.

So, you've got your pages indexed, and made the engines aware of what you're relevant to. Job done? Not quite. The most important (and controversial topic) for SEO is building authority.

Build authority

With the launch of Google in 1998, a new element was factored into search algorithms: authority. This is measured by the number and quality of inbound links from websites to yours. Google was the first search engine to take into account how a website is linked: for example, the more inbound links to a site from similar sites known to the engine using keywords in the anchor text, the more authority is given to that receiving site.

This isn't a perfect system. For instance, if you do a search for 'click here', you'll see Adobe is the number one result. This isn't because its site is relevant for the phrase 'click here'. It's because so many other sites have linked to it using the anchor text 'click here', mainly to the download page for Adobe Acrobat Reader.

This means that your website not only needs inbound links but it also has to have the correct keywords in the anchor text of that link to improve rankings for the keyword.

Google gives a measurement of the authority a web page has using PageRank. This is measured on a scale of 1 to 10, with 10 being the best. Webmasters soon discovered that getting links from pages with a high PageRank improved their PageRank, because some of the value of the linking page was passed along.

This led to many sculpting PageRank to artificially gain value and buying links from pages with high PageRank.

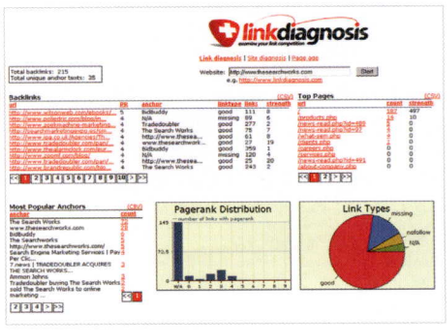
As soon as Google found people were gaming the system, it introduced changes to its algorithm to try to spot paid links. It also added a form to Webmaster Tools so people could report paid links and in some cases banned sites from the index. The most high profile recent case was GoCompare, which was banned from the index in early 2008 for what seems like buying links.

Google now actively seeks paid link reports and has a console in Webmaster Tools to simplify the process. This means certain link building activity has become impossible to carry out without alerting Google to the fact that it's not natural.

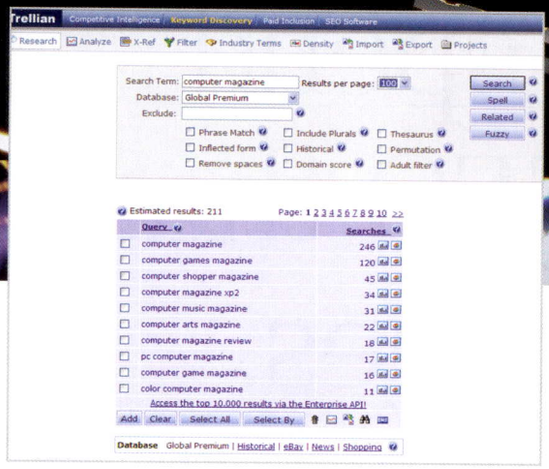
To keep your site safe, you're best off avoiding certain types of link building, such as buying links, reciprocal linking and site wide links.

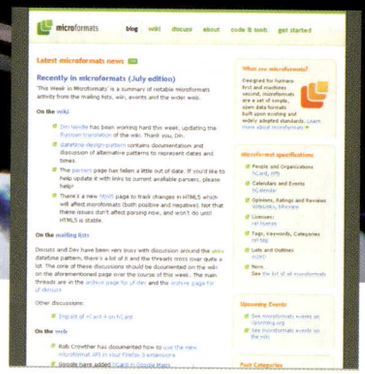
Reciprocal links (also known as link exchanging) are where you swap links with other webmasters. Site wide links are those that appear on every page of a website, usually the sidebar or footer, and these can be seen as paid links by Google.

Ethical link building can be time consuming, but it's worthwhile in the long run. To start with, make sure you have your website listed in SEO-friendly directories, ie a directory that's in Google's index. A list of these can be found at info.vilesilencer.com. A next step could be to write, optimise and submit press releases to online press release distribution sites. Some are free and some require a fee. We've compiled an extensive list for you: go to delicious.com/netmag/pressrelease and click on the links.



Research your rivals Link Diagnosis (linkdiagnosis.com) can show you all the important information about your competitors' links. It's easy to use and best of all, it's free





Above Prepare for the semantic web by using Microformats (microformats.org)
Left Using a professional keyword analysis tool can highlight instant wins

You can also build ethical links by writing distributed content. This is basically an article that one site provides for others to publish rather than publishing it on their own site.

The advantage of this method is that good quality content is always in demand and your links will appear everywhere the article does. Once an article is put online, it's rarely taken down, so the initial cost is just the time you've spent to create and submit it.

Even better, your link will appear on a page surrounded by content relevant to your site and you'll be able to 'deep link' back to related articles within your own site. It's even possible to generate a creative commons licence, which allows anyone else to reproduce your content on their own site, on conditions that they link to your site.

But of course the simplest and most effective way to build links is to create content people want to link to. Whether it be a how-to guide, a Q&A or an interview with a prominent person, be the first to write the latest news in your niche and give away something valuable for free.

Finally, remember that the quality of a link is much more important than the quantity. Building authority is essential and one way you can naturally build links is to 'join the conversation' by getting involved in the explosion of social media sites currently being used by millions of people.

Join the conversation

Social media, social networking, blogging and social bookmarking have turned the web into one big conversation. Sites such as Twitter enable people to post comments on what they're doing directly to the web from their mobile phones.

This has created untold opportunities from an SEO standpoint, but some have been exploited. Sites such as www.digg.com and www.stumbleupon.com have been abused by those trying to exploit their SEO potential, making it very difficult to ethically use either.

But there are fantastic new ways to build links naturally. By creating profiles on social media sites and participating on a personal level rather than as a commercial entity, you can build awareness of your website and services. If you have an authentic story to tell then people will naturally link to you, write about you and send traffic your way.

The simplest approach to social media is to optimise your site so that it's easy for people to share your content and link to your site. This includes adding links to bookmark pages at social media sites: you can do this using a service such as the one provided by Add This (addthis.com). Add links to your Twitter, LinkedIn, Facebook and other social media profiles to your 'About us' page. Make sure you embed a Google Map of your location.

To get ready for the semantic web, you can start to use Microformats (microformats.org). This is a way of marking up the code of your page so that it's human- and machine-readable. To see Microformats that appear on a page and what you can do with them, start using the Firefox web browser with the Operator plug-in, available at https://addons.mozilla.org/en-US/firefox/addon/4106. Eventually search engines will start to read semantically marked web pages and this will enhance user experience and give you the opportunity to be ahead of the curve.

Add links to your Twitter, LinkedIn and Facebook profiles to your 'About us' page

More than anything, just join in. Get a profile on LinkedIn, start commenting on blogs, start using Twitter and Facebook and if you have the time, start a blog yourself. It's the easiest way to build authority and links back to your site.

SEO is a vital part of your online presence, and the benefits you can gain are well within reach if you work smart, get indexed, be relevant, build authority and join the conversation. Get it right and it can provide thousands of qualified visitors, build your brand and maintain your competitive edge.

WWW. *Have you found SEO success? Discuss your experiences at forum.netmag.co.uk.*

Resources

TOOLS

WebCEO
Checking server headers can be a problem, but it's an essential element to ensure authority is being correctly passed between pages. Use this free tool to check your pages and route out those 302 redirects.
www.seoconsultants.com/tools/headers.asp

SEOBook Keyword Tool
One of the best free keyword research tools available online, this allows you to see search volumes for keywords and suggests alternate key terms.
tools.seobook.com/keyword-tools/seobook/

Compete
There's both a free and paid version of this online tool, which checks visitor levels and keywords driving traffic to a website. A very useful way to gain insight.
data.compete.com

Site map Generator for Windows
Make XML site maps with this free tool from Google to help get your website indexed by major search engines.
gsitecrawler.com

136 SEO Tools
A vast array of tools that covers just about everything you'd need to know regarding your website from an SEO perspective.
www.seocompany.ca/tool/seo-tools.html

Link Analyser
This free tool shows the strength of inbound links, the anchor text and how many links to your site users follow.
www.linkdiagnosis.com

BOOKS

Search Engine Marketing Inc
by Mike Moran
A non-technical introduction into search engine marketing strategy that will prove useful to anyone interested in SEO metrics.

Get to the Top on Google
by David Viney
This guide to the basics of SEO is divided into seven steps that broadly follow the timeline of an SEO campaign, with useful case studies.

BLOG

David Naylor Search Marketing
This blog, written by one of the UK's SEO thought leaders, is a great place to keep up to date on what's happening in the world of search engine optimisation.
www.davidnaylor.co.uk

"A lot of people spend more time on SEO than building good pages. It's like an arms race"

Jason Calacanis, Mahalo

www.mahalo.com

He was one of the web's most prolific bloggers. Now, having turned his back on blogging, he's trying to reinvent search. **Oliver Lindberg** talks to online entrepreneur Jason Calacanis

Jason Calacanis isn't exactly the most popular online entrepreneur around. In the past he's called SEO "bullshit" and "a wasted industry" while speaking in front of thousands of delegates at search engine marketing conferences. His Affiliate Summit keynote in February 2008 was less controversial, but Jason still pointed out that affiliate spam was polluting the internet and also joked that anyone in attendance from PayPerPost should kill themselves. And at the Future of Web Apps conference that year he quipped that if you want to be average, you should go and work at 37signals but not for him. Jason Calacanis tells it like it is. And he's not too concerned about the consequences.

Hate figure

"You've got thousands of SEOs who hate the fact that I damaged their industry and told people not to hire an SEO," Jason says. "But I don't mind that. People can disagree with me. A lot of them are anonymous 12-year-old kids anyway – it's no big deal. You can't take it too seriously. People can hate me if they want to and debate what I say but as long as they check out my project and consider using it and talk about it, that's fine with me."

The project Jason is referring to is human powered search engine Mahalo (motto: we're here to help), which uses a full-time team in Santa Monica, plus an army of freelancers all over the world, to write and edit results pages, free from spam and other junk.

"Nobody is really doing it the way we're doing it," Jason explains. "There are a lot of copycats that are trying to do social search and letting people vote, but I don't think anybody is actually paying a couple of hundred people to write really high quality pages.

"We're exactly 50 per cent Wikipedia and 50 per cent Google. And I think that's the future of search, to put a little bit of Google and a little bit of Wikipedia on the same page. Our articles are better than Wikipedia because we have real, paid people working on them and fact checking them. We don't have as many yet but we will. And then our search results are better than Google's because we have humans go through them. It costs us a lot more money than Wikipedia, which spends nothing, but it's probably costing us less per search result than Google because they have a billion dollars in server costs every year."

After just a year and a half in operation, Mahalo reached 100,000 search terms, at which point Jason took the beta label off. Not bad considering the site only launched with 4,000 pages. Jason adds that Mahalo isn't in any rush to make money. The company has secured five years of funding from, among others, Sequoia Capital, CBS, News Corp and Mark Cuba.

One thing's for sure, though: according to Jason, 'curation' and 'trust' is the new business model. Mahalo will do well (Jason hopes for five or 10 per cent market share) because there's a lot of information online but no trust available. On Mahalo there's no SEO.

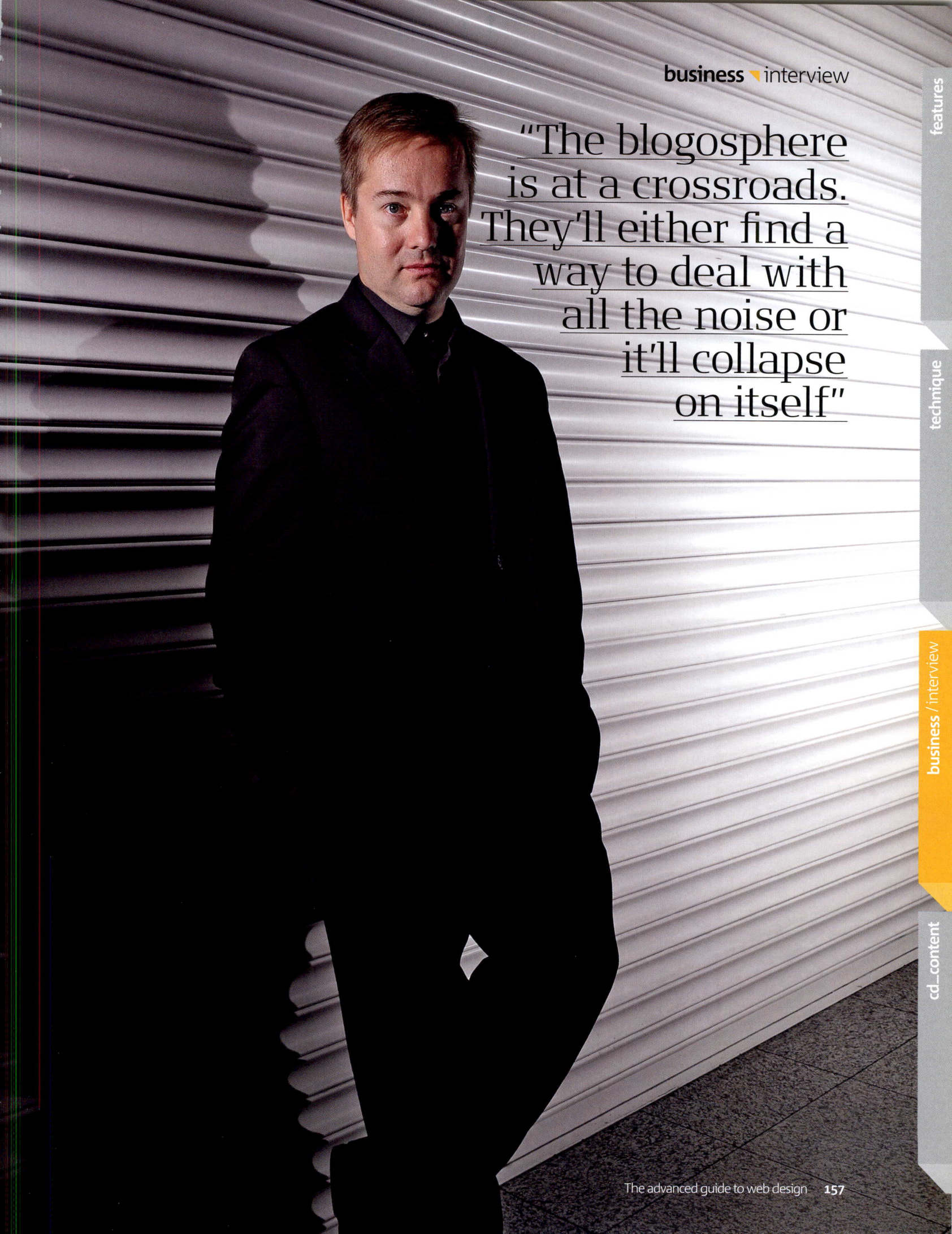
"A lot of people spend more time on SEO than actually building good pages. It's unfortunate that in order to compete in search, you have to spend time doing SEO because there are a lot of people who are making bad sites and then trying to rank them high. People who are doing good content have a hard time. I just think it's like an arms race.

"The solution is to have humans look at the pages and rank them. The algorithm will get you to, let's say, 80 per cent complete and then humans should do the final 20 per cent.

"An algorithm can only take you so far. You might trust an algorithm to tell you the address of a sushi bar or which one is closest to you but you might not ask it which one has the best sushi. You wouldn't expect an algorithm to know what's great sushi but you would expect a human to be able to tell you that. It's common sense."

The death of blogging?

Before Jason launched Mahalo, he was in the blogging business. He co-founded Weblogs, Inc, the portfolio of which includes dozens of blogs such as Engadget, Joystiq and Download Squad. In 2005 he sold the network to AOL for a reported $25million (he now says he'd give AOL a 'B' average for what they've done with Weblogs in the last few years) and, having become >>



"The blogosphere is at a crossroads. They'll either find a way to deal with all the noise or it'll collapse on itself"

Human touch: Serial entrepreneur Jason Calacanis launched the Mahalo search engine

"People can hate me if they want to but as long as they check out my project and consider using it and talk about it, that's fine with me"

Photography/Rob Scott

>> increasingly disillusioned, Jason recently quit blogging altogether.

"It feels like blogging is different to when it started," he explains. "When it started, it was a very authentic conversation and I think it's now more about marketing, promotion and link-baiting. In general, blogging has devolved. There are still great blogs and I still read them but the majority of blogging is not about authentic conversations any more. The blogosphere is at a crossroads. They'll either find a way to deal with all the noise or it'll collapse on itself. Just like Usenet collapsed on itself. There are no good conversations on Usenet."

Private mailing

As an alternative, Jason has started a private mailing list, writing essays on various topics such as 'how to demo your start-up' and 'how to be a good CEO'. Initially, Jason meant to cap the list at 750 subscribers, then it got so popular that he didn't have a choice but to allow more people to join. Within six weeks almost 6,000 people signed up.

"When I'd post on my blog I'd get 10-30 comments and most of them were bad comments from weird, anonymous people," Jason says. "When I moved to the email I started getting 200 or 300 comments – all from incredibly talented people – that were 10 paragraphs long. And they were just to me. On a personal, selfish basis I'm getting more out of this email and these 6,000 people than having 30,000 people read my blog."

In a recent newsletter called '(The) Start-up Depression', Jason predicted that 50-80 per cent of start-ups would fail "or go on life-support (ie three to four folks working on them) within the next 18 months". Today, Jason is a bit more optimistic: "What's the loss? People have three, five or 10 employees, so if the company doesn't work out they can make it a company of two or three people working from home and five people get laid off and go to another company. It's not like the old days when you had people raising $100million or $200million, thousands of employees and then the company goes out and thousands lose their job. If there's a shakedown, you might have hundreds of people that'll lose their jobs and then get hired by Google and Yahoo and other companies. It's not going to result in thousands of people suddenly being out of work and not being able to get a job."

To survive, Jason recommends you either raise a lot of money and invest in the down market or cut all your costs and break even. Mahalo, which itself has just laid off 10 per cent of its staff, should be fine because with five years worth of funding in the bank the company isn't in any rush. And, as Jason points out, "The down market is good for us because we can take market share and it'll be easier to get people to join the team."

At the moment, Mahalo isn't even trying to make any money. Most pages have Google AdSense at the bottom but Mahalo won't sell any proper advertising for another half a year or so. The focus now is on reaching 10 million uniques. Jason is also planning to figure out how people can use the site more and increase the value they get out of the service. A redesign is on the horizon and there'll be plenty more pages. Jason reckons that in 2009 most people will 'get' human powered search and for the time being he's got no plans to sell up and move to yet another market. "I want to try to build the next Yahoo or the next Wikipedia," he says, raising the bar high. "I don't want to sell it too early. I'd rather have it become its own business."

Jason Calacanis

Job Founder and CEO
Company Mahalo
Age 38
Education BA in psychology at Fordham University, Manhattan
Previous career Founder of *Silicon Alley Reporter*; CEO and co-founder of Weblogs, Inc; senior vice president at AOL; general manager of Netscape
Blog calacanis.com

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WEB PRO

Search

Drive traffic to your website using both the power of Twitter and the popularity of video, advises **Mark Buckingham**

Twitter your way to search success

Whether or not you're a fan of the microblogging phenomenon, there's no doubt that it offers new creative opportunities to drive traffic to your site.

The fact that Twitter allows for embedding links in tweets (albeit truncated) will surely be ripe territory for scammers. But it also offers interesting opportunities for businesses who've got something interesting to add to the mix, but don't have the time or inclination to run a proper blog.

Twitter recently started optimising title tags on users' profile pages, making it even easier to brand yourself without committing yourself to a real blog. As a result, status pages themselves are starting to get indexed by the search engines.

Twitter will only work well if you use it in the spirit it's intended, so it's worth keeping to the guidelines and avoiding blatant self-promotion. A good rule of thumb is to throw in something about your blog or business every dozen or so posts.

For bona-fide bloggers, plug-ins such as Twitter Tools will even automate things for WordPress users and you can set it to post a tweet automatically every time you publish a blog post.

Twitter's structure is mostly search engine friendly. It opts for subfolders, unlike Jaiku, which uses subdomains (username.jaiku.com). In terms of SEO, subfolders are treated as part of the original domain, while subdomains are treated as separate sites altogether. So whatever SEO benefits Twitter gets will trickle down to its subfolders, including user status pages and tweets.

People can subscribe to get short blurbs from you (and whomever else they like), and the system is almost instantly self-correcting. It's the complete opposite of email spam hype marketing – if you want off the list, you get off the list.

If you were to spew nothing but hollow hyped-up marketing messages, nobody would subscribe. So keep it snappy and engaging.

Mark Buckingham's recommended ... WordPress SEO plug-ins

Name All in One SEO Pack
URL tinyurl.com/5oqsdk
Info An excellent out-of-the-box add-on that gives you the ability to easily edit titles, descriptions, avoid duplicate content and generate keywords.

Name The Meta Robots plug-in
URL tinyurl.com/cwkd6u
Info Who wants their admin or register pages ranking above their homepage? This enables you to guide Google accordingly.

Name The SEO Friendly Images plug-in
URL tinyurl.com/3t3vg3
Info Automatically updates all your images with proper ALT and TITLE attributes.

How to ... avoid getting banned by Google

Expert advice

Name Darren Jamieson
Job title Senior creative developer
Company Just Search
URL www.justsearch.co.uk

In the world of SEO, everyone's looking for a way to get ahead of the competition. Many SEO firms, websites and forums offer advice, but just how trustworthy is some of this information?

Far from increasing your rankings, you could find that the SEO advice you've found actually hinders you to the point where your website is banned from Google!

Here are some basic tips that you may find useful to avoid getting your website penalised or banned entirely from the search engine listings.

1 Don't stuff your site with keywords
If you constantly repeat keywords to the point of saturation, Google will notice this and penalise you for it. A website should be written with the reader in mind, as if search engines didn't exist.

2 Don't copy content from your competitors' websites
It sounds obvious but this advice is actually given out by some 'experts'. Copying content from other sites will only lead to a damaged reputation and your site being banned by Google.

3 Avoid hiding text on your website
Sometimes you won't want ugly text on your site, especially when it hinders your fluid design. But don't be tempted to use CSS to hide it off the page or change the text colour to the same as the background. This is known as black-hat SEO and Google doesn't take very kindly to it.

4 Don't create doorway pages
Often, people are told to create special doorway pages focused on specific keywords that are designed to rank in Google: when they're visited by a user they redirect to your front page. They're designed to enable you to create dozens of pages, all targeting different keywords, without harming your site's look. However, it's a method of keyword repetition and Google will ban you for it.

5 Be wary of adding too many affiliate links
Adding hundreds of affiliate links along with product descriptions may backfire. Google will demote your site in the listings if it thinks it's an affiliate site.

Contact us ...
Do you have a suggestion or question about search rankings? Use the subject line "Domain" and email us at netmag@futurenet.com

net

Video comes to Yahoo search ads

Does Yahoo's Rich Ads in Search programme represent a change in the face of paid search advertising? The new format, announced in February, places images and videos into paid ads in Yahoo's search results. The hybrid is a bold move by the company as it strives to claw back a percentage of market share from Google.

Rich Ads in Search is invitation-only at the time of writing, but early reports are promising. As Oliver Rapson, director of paid search for the agency Steak, says: "There is huge potential for brands with a strong visual identity to take advantage of this. It represents an additional sales and branding opportunity. Videos of celebrity endorsers, location-specific or seasonal adverts, or even viral campaigns could be reused here."

Advertisers can post images and video to bolster branding impact and create deep links to relevant pages, in order to drive conversion. Logos can be displayed, which enhances user trust, and search boxes can be included within the listing to enable users to look for their desired product or brand location without additional navigation.

Yahoo reportedly started testing the ads as a pilot project in 2008 and is currently expanding the programme ahead of a full rollout. Rumours are, unsurprisingly, that Google and Microsoft are both developing similar rich-media search ads. Some argue, however, that neither has the display advertising experience of Yahoo.

What's clear though, is that it's a step in the right direction for Yahoo and represents an exciting opportunity for advertisers to get creative and dovetail the branding of banner advertisements with the performance-based nature of search. Let the battle commence.

Mark Buckingham is a search marketing specialist, freelance writer and proprietor of netseek.co.uk.

Mark Buckingham's recommended ... New search engines

URL searchme.com
Info Searchme lets you see what you're searching for. As you type, categories appear that relate to your query and you'll see pictures of web pages that answer your search. You can review these pages before you click.

URL kartoo.com
Info Kartoo is a cluster meta search engine that presents results as a map. Despite the slightly gimmicky feel, it gives a useful snapshot of sites and their relevance to each other.

URL quintura.com
Info Visually navigate the Quintura cloud to refine, save and share results. There's a Firefox add-on and Google plug-in too – useful for SEO research and new keyword ideas.

How to ... use friendly URLs

Expert advice
Name Berian Reed
Job title SEO manager
Company Reading Room
URL www.readingroom.com

Friendly URLs are a very powerful tool and creating a well formed and descriptive URL structure should be a fundamental aspect of any website's SEO strategy.

One of the main advantages of friendly URLs is that they improve a website's performance in search engine results by highlighting key words in the URL itself.

They also create a more memorable address for the end user, which in turn makes it easier to share URLs in promotion materials or campaigns.

1 Take it slowly
The key to better URLs is to design them properly from the start; don't rush. It's important to really think about the URL.

2 Be descriptive
Create a simple, descriptive directory structure that relates to your content. Use the directory structure to describe the type of content to the end user and provide a structure. For example, if you have a website showcasing your web design work along with a blog where you discuss web design topics, a good URL structure would be: www.examplesite.com/portfolio; www.examplesite.com/blog; www.examplesite.com/tips; www.examplesite.com/corporate.

3 Keywords are key
This is a significant benefit for SEO because keywords in URLs are highlighted in search engine results pages (SERPs) of Google and other search engines. For example, if you had a page displaying top MP3 players, a good URL would be www.examplesite.com/products/audio/best-mp3-players. It's easy to go overboard, but remember filenames should be concise; if you're creating very long ones then you need to rethink your directory structure.

4 Advanced strategies
Once you've mastered the very basics, there are a number of advanced URL strategies that are worth investigating including 301 redirects, 404 handling, upper-vs-lower case URLs and XML sitemaps, all of which should be added to any budding SEO advocate's toolbox.

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RELEVANT.DATA.
FLASH-DRIVEN.ELEMENTS.
WEBSITE.OPTIMIZER.
CUSTOMER.BEHAVIOR.
SUCCESSFUL.CONVERSIONS.
DEMOGRAPHICS.
EMPHASISING.DIFFERENT.POINTS.
ECOMMERCE.TRANSACTIONS.

Google's guide to Analytics

Brett Crosby provides the inside track on how you can use Google Analytics to drive targeted traffic to your website, understand your visitors' wants and needs, and make informed design improvements

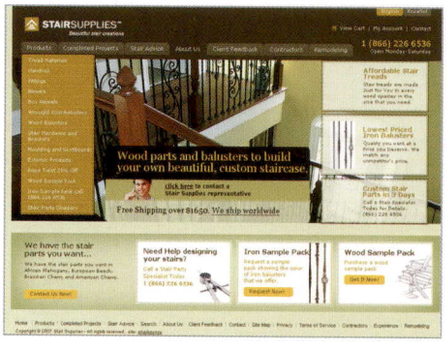
+ Words **Brett Crosby** co-founded Urchin Software and is now Group Manager for Google Analytics. analytics.blogspot.com

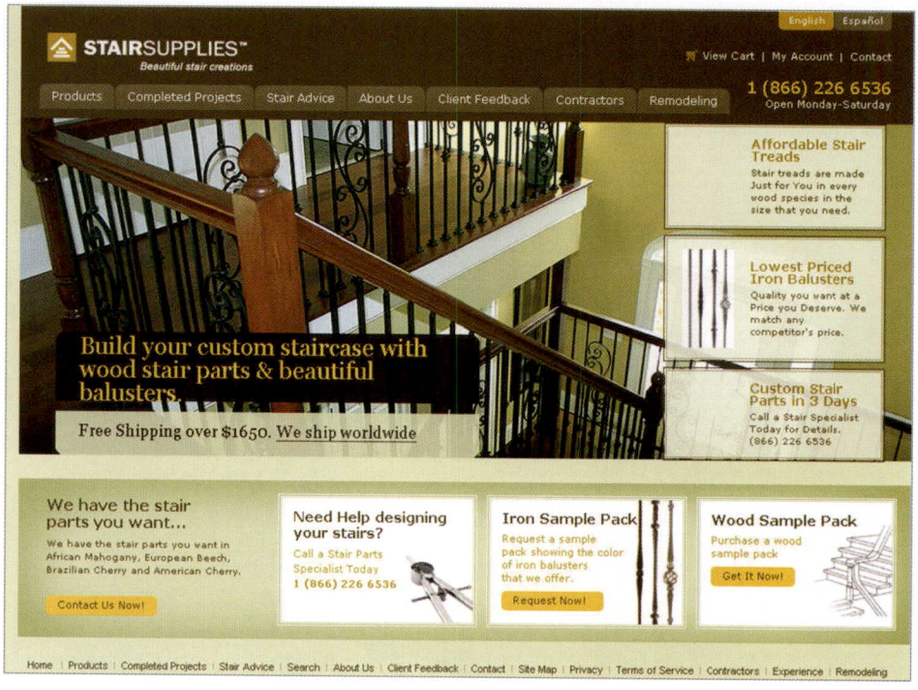
+ Image **The Ronin** Rob Chui's motion graphics and design studio. ilovedust.com

Things change so quickly on the web. When I started working at software firm Urchin in 1996, web analytics was a niche product, important to (and understood by) perhaps a handful of people at an organisation.

When Google bought Urchin in June 2005 and launched Google Analytics later that autumn, the industry was moving away from expensive, complex tools in favour of free, easy-to-use ones, and these are quickly becoming more capable than those of the previous generation. Analytics has also expanded to encompass a larger tool set and conversion process. It includes offline data sources and multivariate testing solutions. Perhaps the largest shift is that virtually everyone is now aware of and able to afford a quality web analytics and multivariate testing platform.

You can sign up for Google Analytics at google.com/analytics. From there, you can create a new, free account. If you advertise on Google's AdWords system, you can also sign up for Analytics from within your AdWords account. Google Analytics has been closely >>





Before and after Stair Supplies, a company that sells parts for home stairs online, found unexpected results by testing their homepage (above) with Google Website Optimizer. A new version (right) without an image of the salesperson, and with the left drop-down menu closed, increased sales by 144 per cent and average order size by 18 per cent

>> integrated into your AdWords account under the new Analytics tab: click the tab and follow the instructions to start tracking AdWords campaign data and ROI information.

The Tracking Instructions page that appears contains the tracking code that you'll need to paste into each page of your site. Before doing so, you might want to complete a couple more steps to make sure Google Analytics collects the most relevant data for your site. You can configure your profile by clicking Edit in the Website Profile table.

Set the default (or index) page of your site. This will allow Google Analytics to reconcile log entries for www.example.com and www.example.com/index.html, for instance. These are in fact the same page, but are reported as two distinct pages until the Default Page setting has been configured.

Does your site use dynamic session or user identifiers? You can tell Google Analytics to ignore these variables and not count them as unique pages. Enter any query parameters you wish to be excluded, separated with commas.

To enable ecommerce reporting and the Ecommerce Analysis report set, select Yes. If your website is designed to drive visitors to a particular page, such as a purchase or email sign-up page, you can track the number of successful conversions using 'goals' and 'funnels' in Google Analytics. A goal is a website page a visitor reaches once they have made a purchase or completed another desired action, such as a registration or download. A funnel represents the path that you expect visitors to take in order to reach their goal. Defining these pages enables you to see how frequently visitors abandon goals (and where they go instead) and the value of the goal. Each profile can have up to four goals, with a defined funnel for each. You can begin defining goals and funnels by selecting a profile and clicking Edit from the Analytics Settings page.

Analytics data provides a peek into the hearts and minds of your customers

Hearts and minds

Google Analytics is not only a way to learn about customer behaviour, it can reveal something that's even more important: customer intent. Analytics data provides a peek into the hearts and minds of your customers and their needs and wants.

How did your visitors arrive at your site? For those who came through a search-engine query, a list of search terms will tell you what they were seeking. For example, shoe shoppers may be looking for Nikes but not Uggs; Clarks but not Donna Karan. You may therefore discover that part of your site is on target for visitors' needs, while

Interview Blogger and video commerce guru Xavier Casanova gives his take on Google Analytics

Xavier Casanova

Job title CEO
Company Liveclicker
Areas of interest eCommerce, web analytics
URL coffeesuntechnology.com; liveclicker.com

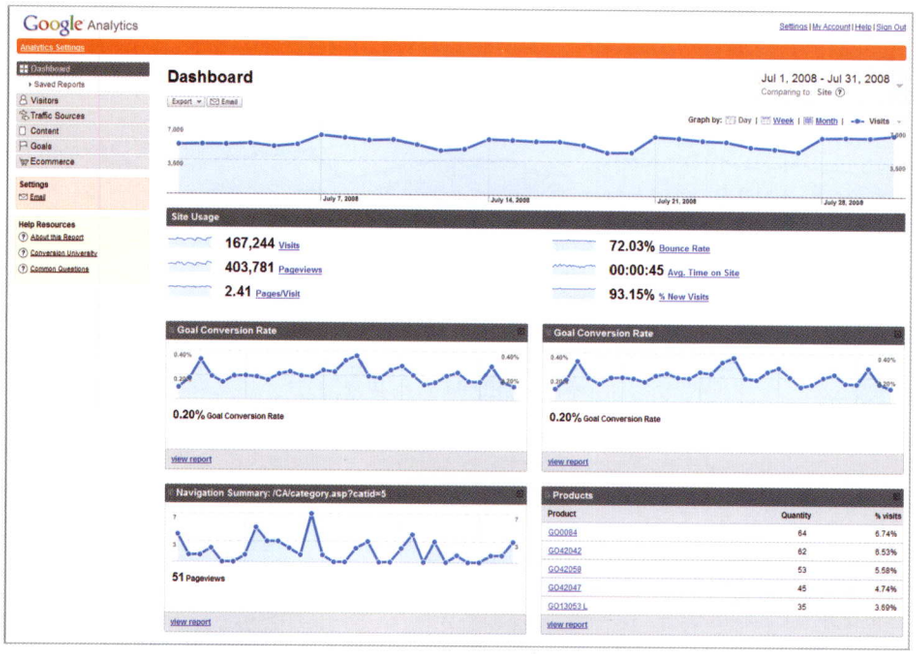
net: Is Google Analytics really worth using?
XC: A month doesn't go by without a marketing manager, director or even VP asking me that question. Web analytics tools keep getting more and more complicated, and many folks are asking the question: "Can we go back to a tool that's less complicated?"

My personal opinion on the matter is: in 99 per cent of the cases, more reports won't help. In 99 per cent of the cases, less will be more, and so, yes, you should try Google Analytics.

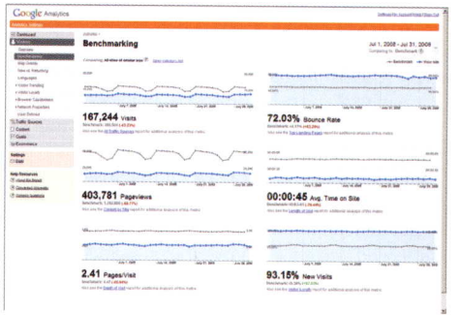
The most common objection I hear is: "We don't want Google to have access to our site data." But what information could Google possibly use, and for what reason? Yes, it could figure out where you're also buying your clicks from, and the volumes, then decide to discount or not discount your click costs based on the information. But would that make a huge difference to Google anyway? It owns the SEM market, and pretty much has all the pricing power it wants already.

People also tell me "Google Analytics is too simple for our business needs." This goes back to the classic mistake buyers make: picking the tool that has the most reports and the flashiest UIs and ignoring the most important part of the web analytics equation: people. It's the people who will make your analytics investment work, not the tools.

net: Should I run Google Analytics side by side with Omniture?
XC: IT folks will argue this will slow down the page (you're adding to the page load with another JS that's typically 15-20Kb). I think that's a fair statement. I frequently see pages waiting for the google-analytics.com server response (typically people running multiple analytics technologies), which impacts page performance but also the accuracy of your reports. On the other hand, the average page size is now over 200KB, and another web analytics tag certainly isn't going to all of a sudden kill your site.



How are you doing? The new and improved dashboard for Google Analytics provides you with a quick snapshot of how effectively your website is currently performing. It can also give you easy access to more specialised reports



Go compare By opting in to Google Analytics' useful Benchmarking feature, you'll be able to quickly compare your website's performance with anonymous aggregate data from other sites in your industry or vertical

the other half isn't. Similarly, Google Analytics can give you a list of 'referring URLs', websites that send you traffic. You can infer, for instance, that visitors coming from happycoupons.co.uk will have a different goal (making savings) than those coming from a manufacturer's retail link page (finding out about product features).

What are visitors looking for? Your checkout page tells you only where you've succeeded – not where you've missed an opportunity. Consider Best Buy's experience stocking a portable refrigerator to chill beer in the US. At first, they stocked it only during the Super Bowl. But search keywords reports revealed that shoppers still looked for the product code well into the baseball season – yet they couldn't find anything on the site.

Other key data that goes beyond conversions is the 'cart abandonment' rate: the percentage of customers who put items in the cart but leave your site before checking out. This crucial metric of your site's ability to close sales may indicate that something's amiss with your checkout process.

Where are your visitors landing, bouncing, and viewing? It's often assumed user experience begins on the homepage, and this misconception drives many an ecommerce site to waste hours of design work in the wrong place. Search engines dig deeper into ecommerce sites, bringing visitors to not just 'electronics', but also televisions, MP3 players or sat navs. Analytics data will tell you where your real 'homepages' reside, so you can focus your design work there. Curious? Just take a look at the 'Top Landing Pages' or 'Top Entry Pages' report in your Web Analytics tool.

Conversely, analytics will tell you which landing pages have the highest bounce rate – ie on which did people land, look around and quickly leave? This data tells you which of your pages are letting your customers down, and can also help with your redesign, since you can infer intent through the list of keywords and referring sites.

Web analytics can also show you the top viewed pages: information that's often overlooked. While you may consider yourself in the business of selling products, most of your hits could represent people reading customer reviews. Or perhaps you're selling 10 lines of products, but two of them show especially high traffic. Knowing what interests your customers will help you design a site that better meets expectations.

Analytics can help you understand what drives performance up or down. Earning $15,000 in the last 24 hours is good; knowing what drove that surge is even better. Ecommerce tracking shows the number of orders placed, the value of those orders, and more, by hour, day, week and month. By segmenting your data over different time lines, you can see both seasonal trends and more subtle buying habits that could otherwise go unnoticed.

Putting this information into practice takes not just creativity, but also a time, we increased spend on Google AdWords, knowing that Google Analytics would show us the cost per user."

Since then, search advertising has become the cornerstone of Heatworld.com's online marketing strategy. At any one time, the site is running a number of keyword campaigns using Google AdWords. Says Cummings: "It's simple really. Google AdWords and Google Analytics help me achieve my monthly user acquisition targets and maximise ad revenue."

Earning $15,000 in the last 24 hours is good; knowing what drove that surge is even better

Case study Heatworld.com

With celebrity magazine *Heat* well established, its publisher wanted to apply its winning formula online with Heatworld.com.

Nicole Cummings, Heatworld's digital brand manager, was keen to get the business model right. "We needed lots of people visiting the site to attract advertisers," she explains. She was also keen to attract the right *quality* of traffic: a thriving website had the potential to bring new audiences to the brand. "We wanted as many of the unique users as possible to be first-time readers," she says. "And I knew that search marketing using Google AdWords could attract large numbers of new brand advocates."

A key strength of Google Analytics is the fact that it integrates seamlessly with AdWords. It also enables you to experiment more freely with cost-per-click (CPC) rates and the effectiveness of keywords. "Google Analytics helped Heatworld.com optimise its keywords fast so it could take advantage of the interest around *Big Brother* in August 2007," recalls Cummings. "Based on our insights, we switched from tactical activity around *Big Brother* to more generic keywords around celebrity gossip. Suddenly the campaign started delivering a lot of traffic to the site. At the

Hot to trot Google Analytics played a crucial part in ensuring *Heat* magazine's website attracted the kind of traffic that would make its business model a success

willingness to experiment. This spirit of adventure comes through on some of the most successful retail sites. Crutchfield (crutchfield.com) has taken the unorthodox approach of putting its checkout cart on the left side of the screen. Is that a good idea? Analytics reports have confirmed that it is – at least for them. Wal-Mart commonly puts products on its website that are unavailable in its stores. When those zebra-patterned bed sheets prove they have a following, the company understands the demographics enough to place them in targeted store locations.

Recent changes

Earlier this year we redesigned the Google Analytics site. The goal was to make it easier to discover information relationships via navigation and visualisations. We created a customisable dashboard and introduced sparklines. We developed new graphing tools and a new type of date slider, which make it easy to see spikes and dips in traffic as you set date ranges. And one of the most popular new features is one of the simplest: the ability to email reports and schedule these emails so that information can be easily shared with key stakeholders in your organisation.

New visualisations have been among the most popular features. You can now view many reports by hour or day and graph data by day, week or month. And we've made it easier to compare visits to conversions. You can also graph two metrics against each other over time so, for example, you can compare the number of visitors and the bounce rate for a certain week, or see if visitors who come to a site through AdWords spend more or less time on your site than visitors overall.

We've also added a new ga.js tracking code. This pagetag allows for more flexibility and customisation. It's just as easy to install as the old code, but enables more seasoned users to track ecommerce transactions in a more readable way and make use of advanced tracking features. We've also added a Google Analytics codesite (code.google.com/apis/analytics/docs/) to help you take advantage of documented customisations that have been made to the tracking code.

If you have content behind a security firewall, an intranet or an internal network that prevents you from using Google Analytics, you may also want to consider Urchin software. You can configure it to fit your own requirements and process/reprocess log files as frequently as you wish. Urchin is also great for intranets, since it allows the analysis of firewall-protected content, such as corporate intranets, without any outside internet connection. You can even track your site with Urchin and Google Analytics combined.

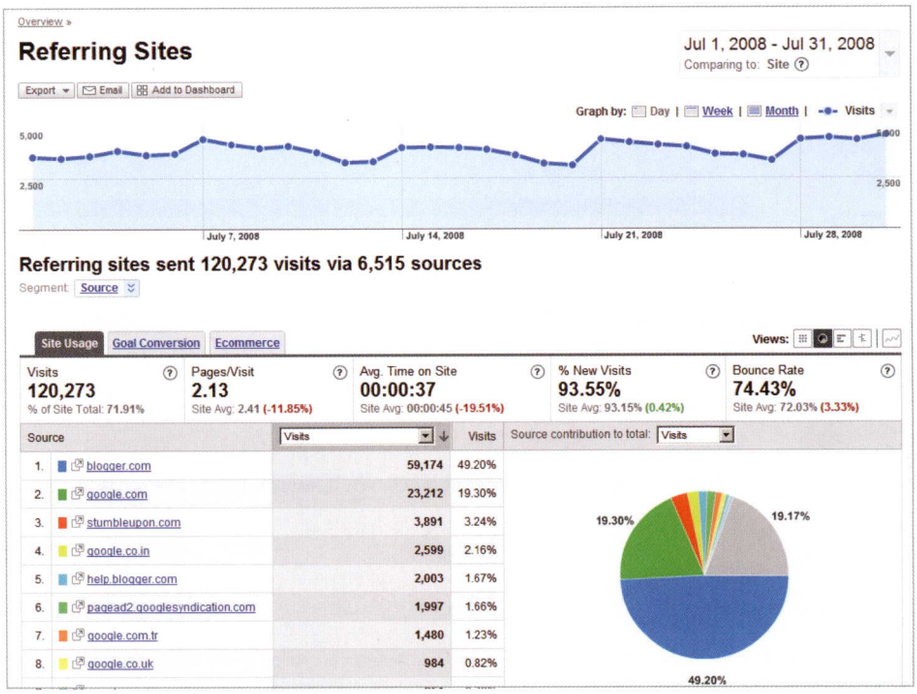
One of the coolest things we've recently added is industry benchmarking. Still in beta, it enables you to see how your site's data compares to others'. For example, if you have a travel website and you get a spike in traffic on Mondays, you may want to know whether other travel sites get that same spike. We don't share individual data with competitors, but bucket data into industry verticals and then anonymise and aggregate it.

Finally, Website Optimizer is a free tool that complements the functionality of Google Analytics to hone your site further. You can create different versions of your web pages, and Google then splits your traffic automatically, so your visitors tell you which version they like best. Things you might consider changing include images (bigger, smaller, colour, black and white, with models, no models); headlines (questions, shorter ones, emphasising different points); calls to action (different button designs and copy) and layouts (three columns, two columns, one long scrolling column).

Test a few big changes, not several small ones. A good rule of thumb is one page variation for every 100 conversions. So if you get 300 conversions per month, test up to three variations, including your current page. Run your test for at least two weeks. Don't jump to conclusions: make sure the data has an opportunity to normalise.

Make testing an ongoing process. Once you find a winner, keep trying to beat it. Remember that not finding a winner can be helpful, too, since you learn what doesn't work and you protect yourself from making changes that could have permanently harmed your site's performance. ●

WWW. *Has Google Analytics helped improve your site? Share your experiences at forum.netmag.co.uk*



Traffic trends How do the people referred from other sites compare to the 'average' visitor to your website? The graph shows the overall trends in traffic volume from referrals while the table lists the sites driving the trends

You can now view many reports by hour or day and graph data by day, week or month

Conversion funnel Measuring progress towards your goal

Google Analytics provides in-depth information about every aspect of a website: where visitors come from, which keywords they use, which pages they visit, whether they convert and if they do, the route they take to get there ... It's like footprints in the sand: you don't know who made the tracks, but you know where the accumulated footprints went. Those tracks are absolutely key in understanding how your website works – and how you can improve it.

You can also think of these tracks as moving down a funnel. At the rim is the landing page where people actually enter the website. At the spout is the achieved goal: a completed sale, or whatever you deem a conversion, action or destination. The funnel is about conversions, and Google Analytics can help you evaluate how well your website prompts customers to take the action you want.

Getting there Once your site objectives are established, you can measure progress using a conversion funnel

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/Analytics/get more out of Google

To get more out of Google Analytics, you need to put more in. **Tim Whitlock**, senior developer at Public Creative (publicreative.com), leads the way

Your essential CD
All the files for this tutorial are on the CD.

Knowledge needed JavaScript

Requires Text editor, Google account, web space

Project time Ongoing

Since acquiring Urchin in 2005, Google has brought professional web analytics to the masses. In typical style, this has been achieved in three ways:

1. **It's free of charge to everyone.**
2. **It's a fully hosted service.**
3. **It's really good.**

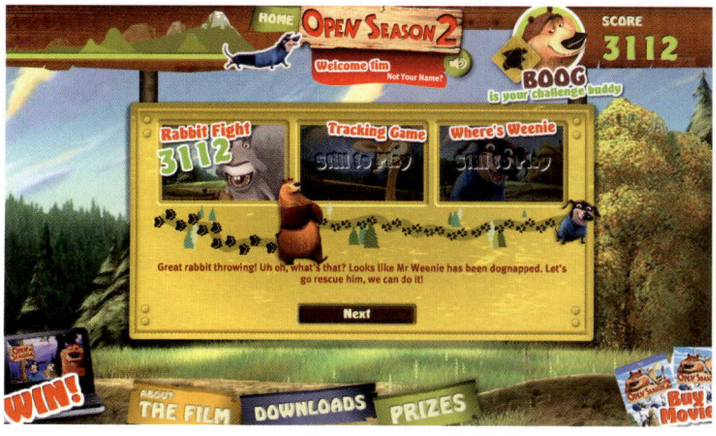
Although Google still offers the original Urchin software as an installable solution, the free, hosted Google Analytics offering clearly takes centre stage. Despite being completely free, many of the biggest brands you could mention have adopted Google Analytics in place of enterprise solutions such as Omniture's SiteCatalyst.

The majority of our clients at Public prefer to use Google Analytics, which makes it an important part of what we do. There are specialist companies that consult on analytics, but any digital agency worth its salt should be able to consult in this area.

As most of our work is campaign-led, quantifying the success of a project is critical; increasingly so in the current climate. In an environment where clients are working harder to justify online spending to financial directors, obtaining good quality data makes their job easier and their online budgets less difficult to justify.

Getting more out

Google has added some really great features to the Google Analytics reporting suite recently and it's important to stay on top of these developments. As Google continues to compete with enterprise solutions (especially now Yahoo is in the game), expect to see increasingly advanced tools emerge. At Public, we make sure that our developers and producers are all proficient users of the suite. Most of our clients are pretty proficient themselves, so they rarely need much advice on this front. However, reporting tools are only half the story. No matter how good your analytical tools are, your reports are only as good as the data you've gathered. To get more out, we need to put more in. The default approach is to chuck your tracking code onto each page, then sit back and wait for the stats to come in. This is the lazy approach. It's your job to ensure that good, wholesome data is being collected to obtain the best possible insights.



Right on target The promotional microsite for the 2008 animated children's movie *Open Season 2* tracked users' paths through games to measure their playability

Expert tip Log-based stats

Gathering raw visitor data has historically been done by parsing server logs – this is how Urchin software works and it's a bit of a trade-off in terms of capability. JavaScript methods provide more reliable session and visitor tracking because standard log files don't include cookie data. It also has access to a wealth of metrics including screen dimensions and installed plug-ins. It's still worth compiling log-based stats for the data JavaScript can't provide; log analysis tells you about visiting robots, image requests and error pages. Many hosts throw in a Webalizer for free, while Analog and AWStats are also free and equally as clunky.

Putting more in

The default Google Analytics tracking code logs individual page views using JavaScript. This means two things.

1. Visitors with JavaScript disabled (mostly robots) don't get tracked.
2. Only clicks between single, whole HTML pages are tracked.

That first point is a tough one, but generally we're only really interested in human visitors. In most normal cases, your JavaScript-enabled guests should provide you with sufficient data to generate decent reports. Robot visitor tracking can be useful in evaluating the crawlability of your site, but there are other ways to do this, such as using Google Webmaster Tools.

The second point is something we can definitely improve on. Why just track page views? What about other important content, such as PDF downloads?

In this day and age, a visitor to your site may be interacting in numerous ways without leaving a page – playing with Ajax widgets, watching video clips, playing Flash games. And what if a user clicks to another site? How will you know where they went?

As we've already established, Google Analytics is a JavaScript only solution, so a little JavaScript knowledge can put us in a good position to collect some better data. Let's look at the standard Google Analytics tracking code that you place at the bottom of your HTML document:

```
<script src="http://www.google-analytics.com/ga.js" type="text/javascript"></
script>
<script type="text/javascript">
var pageTracker = _gat._getTracker('UA-XXXXXXX-Y');
pageTracker._trackPageview();
</script>
```

The **_trackPageview** function is what interests us here. Although it's not evident in the code above, this function accepts a single string argument. Any value you pass

Top 15 of 284 Total User Agents			
#	Hits		User Agent
1	1012	8.82%	Mozilla/5.0 (compatible; Yahoo! Slurp; http://help.yahoo.com/
2	822	7.16%	Mozilla/5.0 (Windows; U; Windows NT 6.0; en-GB; rv:1.9.0.5) G
3	741	6.46%	Mozilla/5.0 (Windows; U; Windows NT 6.0; en-GB; rv:1.9.0.6) G
4	620	5.40%	Mozilla/5.0 (compatible; FriendFeedBot/0.1; +Http://friendfee
5	499	4.35%	Apple-PubSub/65.1.1
6	494	4.31%	Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.9.0.6) G
7	404	3.52%	Feedfetcher-Google; (+http://www.google.com/feedfetcher.html;
8	399	3.48%	FeedBurner/1.0 (http://www.FeedBurner.com)
9	369	3.22%	Mozilla/5.0 (Windows; U; Windows NT 6.0; en-GB; rv:1.9.0.1) G
10	338	2.95%	Mozilla/5.0 (compatible; Googlebot/2.1; +http://www.google.co

Robots in disguise A Webalizer screenshot showing a Yahoo robot in the number 1 slot, alongside a few others

to it fires straight off to your analytics account and gets logged as a content path. You can call this function any time you like and, according to Google, up to 500 times per user session.

Tracking downloads

If your site has download links, these files will be exempt from the default page view tracking.

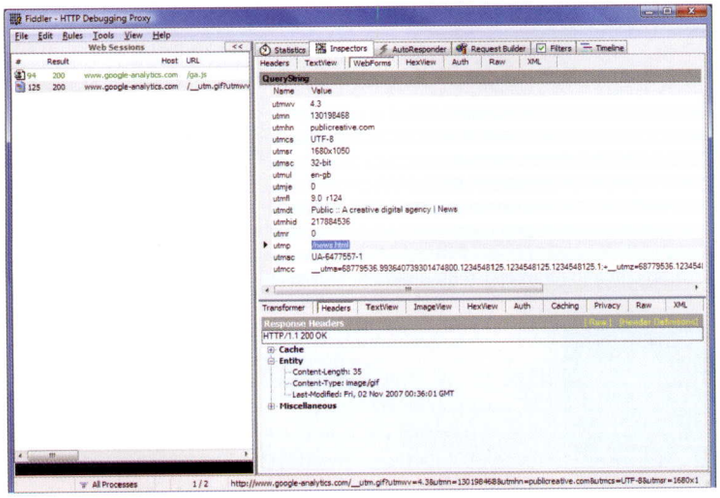
Even though they all have their own unique URLs, they won't execute the tracking code, so let's fix that. Without interfering with the links, we can add a simple inline **onclick** action:

```
<a href="foo.zip" onclick="trackLink(this)">Download my cool software</a>
```

It's convenient to pass **this** to the **trackLink** function; it's compact and also gives us an immediate object reference to the link itself. This function isn't a part of Google Analytics – we're going to write it. It's a simple utility function that takes the link as an argument, does a bit of string manipulation and then calls the actual Google Analytics tracker.

```
function trackLink( elLnk ){
  var regLocal = new RegExp("^https?:\\/\\/"+window.location.hostname);
  var path = elLnk.href.replace( regLocal, '' );
  if( path && path.indexOf('/') === 0 ){
    pageTracker._trackPageview( path );
  }
}
```

The function strips the full URL down to just a page path using a regular expression and, if the link is valid, it fires the tracker. Your download URL will now start to appear as a regular page view in the Google Analytics dashboard.



A bit of a fiddle This hard work is no use if you can't verify it's working, but programs such as Fiddler will carry out detailed inspections of Google Analytics tracking requests

Expert tip Historical note

UTM stands for Urchin Traffic Monitor. The HTTP request to the UTM is actually for an image, which may seem odd, but this is a legacy of methods that don't have to rely purely on JavaScript. A transparent, one-pixel gif can be embedded on a page with the correct tracking parameters in the query string of its URL, and this would create the 'hit'. This method is not used with Google Analytics, which is purposefully easier to use.

Event tracking

Event tracking is brand new to the Google Analytics armoury. It's been in closed beta for a while and, until recently, has only been available through the gaforflash tracking API for Flash (http://code.google.com/p/gaforflash/).

Pages don't really exist in Flash – not in the traditional sense. The notion of a page is whatever suits your application, so it's been common in Flash development for years to create imaginary content paths. You might think more in terms of

It's your job to ensure good data is being collected to obtain the best insights

'events' than 'views', so to track the playing of a video you may log a path such as **/video1/click/play**. The new event tracking feature is a godsend for this and will make fictional content paths a thing of the past.

Tracking external links

Because the **_trackEvent** feature is so new, we'll cover the old method here too. Tracked events (currently) take much longer to appear in your Google Analytics reports, so there's a slight advantage in hanging on to the old method, for a while at least. Suppose we have an external link with another **onclick** action:

```
<a href="http://www.publicreative.com/" onclick="trackExternal(this)">Visit
the Public site</a>
```

We'll make another utility function for tracking external links, **trackExternal**:

```
function trackExternal( elLnk ){
  var path = elLnk.href.replace(/^https?:\/\//, '/external/');
  if( path && path.indexOf('/external/') === 0 ){
    pageTracker._trackPageview( path );
  }
  return true;
}
```

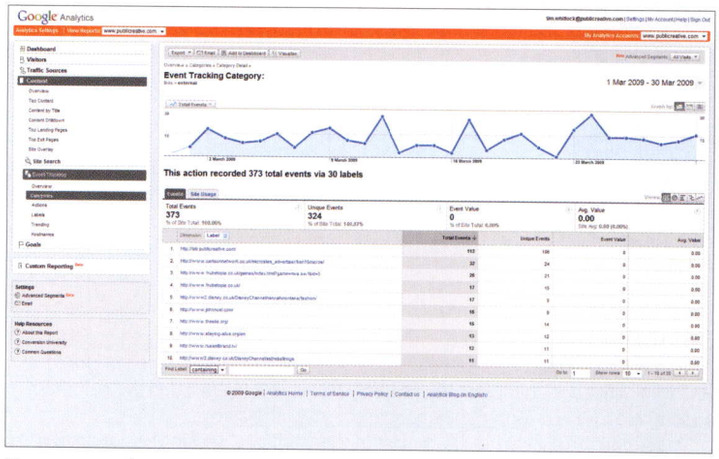
This function works very similarly to the first except that, because the link exists on another site, we use an artificial path. Instead of tracking the full URL, the function replaces the domain part with **/external/** so the path that gets sent is **/external/www.publicreative.com/**. In our Google Analytics reports we'll be able to identify all clicks on external links as they'll all look like this – but we'll talk more about the reporting side of things later.

If we were to use event tracking instead then we'd need to use a slightly different function:

```
function trackExternal( elLnk ){
  pageTracker._trackEvent('links','external',elLnk.href);
  return true;
}
```

The **_trackEvent** function can take three parameters: category, action and label. So instead of the artificial path, we can pass a more meaningful hierarchical chunk of data. Here we choose a category that we've called **links**, an action called **external** and we pass the full external URL as the label parameter.

>>



Keep on track It's important for web development agencies to use Google Analytics to actively seek the best visitor tracking data, not just sit and wait for it to roll in

Making it less intrusive

You may think that adding the **onclick** for every link is a bit of a pain. Not only is it a pain, but it's also a rather old-fashioned and intrusive method. You may also find yourself using a CMS that doesn't enable you to add **onclick** attributes, or the person using the CMS may not know how to add an **onclick**.

Here's the extra code we've added to our company blog to ensure external clicks anywhere on a page are automatically tracked without any intervention at the content level.

It calls the **trackExternal** function we created earlier.

```
function onExternalClick( Evt ){
  var elLnk = Evt ? ( Evt.target ? Evt.target : Evt.srcElement ) : event.
srcElement;
  trackExternal( elLnk );
  return true;
}
var lnks = document.getElementsByTagName('a');
var regLocal = new RegExp("^https?:\/\/"+window.location.hostname);
var i, elLnk;
for( i = 0; i < lnks.length; i++ ){
  elLnk = lnks[i];
  if( ! /^https?:\/\//.test(elLnk.href) || regLocal.test(elLnk.href) ){
    continue;
  }
  if( elLnk.attachEvent ){
    elLnk.attachEvent( 'onclick', onExternalClick );
  }
  else if( elLnk.addEventListener ){
    elLnk.addEventListener('click', onExternalClick, true );
  }
}
```

This function again uses a regular expression to see which links lead to other sites. Those that do get a click event handler applied to them, which eventually calls the tracker. The code doesn't require any libraries, but if you wanted to use jQuery or something similar you could trim down the amount of code required to perform the event handling.

We aren't directly assigning an **onclick** function to the link. Instead, we use the browser-specific event listening methods. This ensures that an existing **onclick** handler isn't overwritten.

If no such method is available, we don't fall back on the old technique. The philosophy here is that tracking, though important, still comes second to user experience. If it's going to fail, or cause trouble elsewhere, we bow out gracefully. This is why in the full, commented code on the CD you'll see extensive use of try blocks, to suppress errors.

After you start collecting data, your juicy new stats can start appearing within a few hours – but that's far too long to wait to find out if it's working.

Although we can't validate what's happening at Google, we can certainly check that our tracker is sending data and that the data is what we want.

Testing and debugging

Tracking data sent to Google is nothing more than a regular HTTP request with a long query string. Any HTTP inspector will enable you to see these HTTP requests going out from your browser. In the raw, a click from our homepage to our news page might look like this:

```
GET /__utm.gif?utmwv=4.3&utmn=130198468&utmhn=publicreative.com
&utmcs=UTF-8&utmsr=1680x1050&utmsc=32-bit&utmul=en-gb&utmje=0&
utmfl=9.0%20%20r124&utmdt=Public%20%3A%3A%20A%20creative%20
digital%20agency%20%7C%20News&utmhid=217884536&utmr=0&utmp=/
news.html&utmac=UA-XXXXXXX-1&utmcc=__utma%3D68779536.9936407393
01474800.1234548125.1234548125.1234548125.1%3B%2B__utmz%3D687795
36.1234548125.1.1.utmcsr%3D(direct)%7Cutmccn%3D(direct)%7Cutmcmd%3
D(none)%3B HTTP/1.1.
```

It's possible – but very ugly – to read this raw output. Allow me to introduce to you your new best friend, Fiddler (fiddlertool.com) – by far my favourite HTTP tool. This is only available on Windows, but there are substitutes. A reasonable alternative is the network monitoring feature in Firebug (getfirebug.com).

Switching to the Web Forms view in Fiddler, it kindly decodes the value pairs in the URL and we can clearly inspect all the mysterious parameters that are being sent to Google.

Here we can quickly validate that our external link path is being sent to Google, and that the response is 200, OK. Assuming your tracking code is correct and there are no problems at the Google end, you can be as certain as possible without breaking into Google's data centre that your stats are in the post. In the screen shot above we've also enabled the filtering option to only show requests to google-analytics.com; just marvellous.

It's also worth noting that tracking from a local network server or the local file system may result in no tracking call being sent. This is a good thing for keeping your stats clean, but don't bang your head against a wall if you don't see the calls – try it from an internet domain.

This tutorial wouldn't be complete without a quick dip into dealing with all the new data. You may have already spotted one gotcha – the artificial paths we've talked about still count as page views in our content breakdown. In reality they're quite the opposite, so to keep our stats clean and accurate, we need to split these results out.

The segmentation featureis a great candidate for keeping artificial paths separate from real page views. This is easy to set up and can be used to split most metrics into external clicks and internal page views. Segmentation is a great feature, but in this case it's ultimately a workaround. One of the main advantages of the new event tracking feature is that these stats are already split out for you.

Expert tip Artificial paths

When Public built the *Open Season 2* microsite for Viacom, event tracking was still in closed beta, so in the more traditional fashion we defined events using artificial paths. Our paths contained quite a bit of data (eg **/en/GB/boog/game1/start**). With these event-driven statistics, we could analyse how successful the games were in terms of a user's experience. The paths also told us in which language they played the game and which of the *Open Season* characters they chose. This kind of additional data can only benefit the client and gives them a whole other level of vital feedback on their campaign and ultimately their product.

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Clients MTV, Cartoon Network, Discovery Channel, National Lottery, Disney Channel, Virgin Media, Swatch, Yoplait
What makes you laugh? Microsoft press releases

John Prior on...

Danger! Analytics!

Web analytics packages can sometimes do more harm than good, cautions John Prior, senior consultant at **Sense Internet** (www.sense.co.uk)

Knowing what your users are doing is so obviously useful that anyone suggesting rolling out one of the many web analytics packages available onto your website is unlikely to be questioned too closely.

Best case scenario: you spend tuppence-ha'penny on a free package, discover the more Mariachi music you feature, the more users love your site and send you money. Worst case scenario: you discover you're already doing everything right. Or you don't find out much at all. But you're just measuring stuff and it can't actively hurt. Can it? Well ...

Most off-the-shelf analytics packages require users to install a web bug in website pages. No big deal, unless maybe you pick one that runs on a custom subdomain and you forget to sort out the SSL certificates. That's a great way to deliver hot, steaming fear fresh to your customers just as they're about to give you money.

Modern browsers scream about non-secure items on the page like an agitated macaw. That's unlikely to increase users' confidence in your site. You're learning more, but scaring customers.

> "Browsers scream about non-secure items on the page like an agitated macaw" John Prior

Web bug-based analytics packages reduce your control of website performance and slow it down. If you add an analytic cornucopia of tags for all the services you've ever partnered with, all the extra DNS lookups and HTTP connections are going to lather gobbets of treacle over your site's overall responsiveness, despite the diminutive nature of each individual web bug. You're learning more, but you're making your customers wait. And unhappy.

So many partnerships, so many measurements: do you have a more fundamental problem? More problems loom. If different teams have been set narrowly defined goals requiring separate measurements, they'll be working against each other, not together. You'll be learning more, but arguing more, too.

Jumping at shadows

Then there's the risk of jumping at shadows; embarrassing when you find out that the ferocious, mandibular jaws that haunted your waking dreams were a peculiarly unnecessary arrangement of ferociously random knick-knacks. Catching developing trends early is the whole point of what you're doing, but don't lose sleep over every chance fluctuation.

However, you're not going to reach building a valid hypothesis – even on an established trend – if you only look at a single number. A trend towards longer visit times feels intuitively positive, but may actually mean that users find your site more difficult to use or that it's taking longer to respond (maybe because of all those tags). You're learning more, but you're no wiser for it. Learning more can set you back if you get it wrong: with faulty, misinterpreted or misused data you'll make the wrong choices. How do you get it right?

Ensure performance and security are not compromised. Start with an off-the-shelf package. Look for questions you still can't answer. Then add custom-built monitors as necessary.

Use measures to track progress towards goals, not as proxies for goals. When a measure changes, look for other changing measures and possible relationships between them. Look for diverging trends; measures that don't change when previously related measures do may indicate a fundamental shift in users' behaviour, or expose a flaw in your user behaviour model. Look for seasonal patterns and other influences beyond your control and correct your results for them.

Expect fluctuations. Don't over-interpret minor changes unless you identify a clear trend. Make sure you understand all of your measures and can account for all significant changes. If you think you've found the cause of a trend, make sure it actually precedes the effect you're trying to explain. Treat any hypothesis to explain changes as suspect and try to prove it false.

Make predictions and test them when you make changes; improve your ability to assess unwanted consequences ahead of time. If you're trying to find out people's intentions, you might be better off simply asking them outright.

Getting meaningful interpretations of accurate measurements is incredibly powerful; knowing the impact of changes means you can innovate freely. You don't have to take the full consequences if things don't go to plan because you'll know if you need to back out, and you still get to take the full benefits if you get it right.

John Prior is a senior consultant at Leeds-based web consultancy Sense Internet (www.sense.co.uk).

WEB PRO

Analytics

Hugh Gage looks at the latest hot topics including change tracking, engagement, segmentation and multivariate testing

The importance of change tracking

Christmas is hurtling towards us once more, and this is a good time to reflect on sins regularly committed over the Yuletide period in the rush to capitalise on the annual consumerfest.

The more well organised and generally larger ecommerce operations tend to lock down major development on their sites from the end of September, October at the latest. Other smaller outfits are still making final tweaks right up into the first and second weeks of December. Either way, in the first few months of the New Year, there is a wealth of information about the site and acquisition performance that will reveal which strategies and tactics on the web design and acquisition front worked best. Or is there ...?

There have been occasions when I've shown trended data to a client indicating a step change in performance either one way or the other and followed up with the question, "What did you change then?" (for a web analyst cannot know everything). This is often followed by a little head scratching and then sometimes a blank. Working on the basis of cause and effect, if the cause isn't known, the effect that may be apparent is almost worthless if it can't be either replicated or eliminated depending on whether it was good or bad. It's surprising, then, how often change tracking is forgotten about. Yet it's as important in web analytics as the data. So much so that it should be seen as an integral element of the ongoing performance optimisation process.

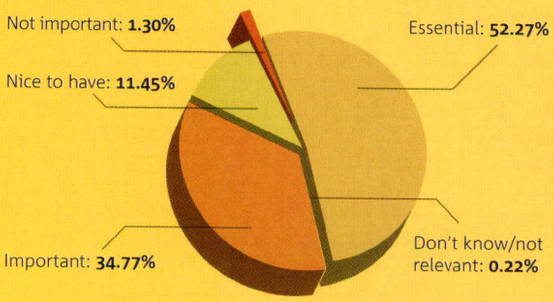
Change tracking is the responsibility of many different stakeholders within the organisation, ranging from marketing, ecommerce and web development to merchandising and individual product managers. However many differing departments and stakeholders there are, each has a responsibility to log the changes they make in the implementation of their strategies and tactics where they are likely to have directly measurable effects on the performance of the website and business.

It's often a good idea to set up a central location where all change tracking information can be stored and accessed by everybody. Ultimately, as long as it's being tracked and can be plotted against data over time, it will become usable and subsequently have a significant impact on the ability to improve performance.

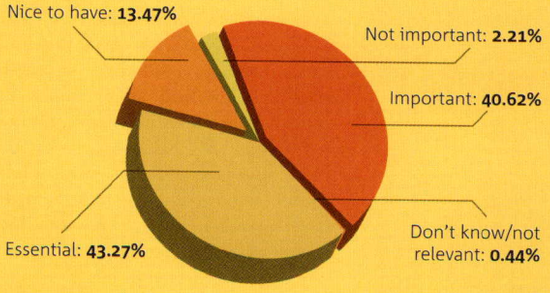
Experience often leads to improvement and it's easy to look back in hindsight with 20/20 vision if you put in a bit of effort on the way.

Statistics

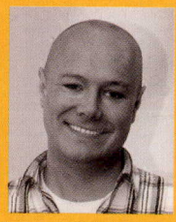
How important is customer engagement to your organisation (company respondents)?*



How important is customer engagement to your organisation (agency respondents)?*



*Source: 3rd Annual Customer Engagement Survey cScape/e-consultancy



Q&A

Name Richard Sedley
Job title Director, customer engagement
Company cScape
URL cscape.com

.net: What is the broad definition of online engagement?

RS: I use the following definition: 'Repeated interactions that strengthen the emotional, psychological and physical investment a customer has in a brand'. The key words here are 'investment' and 'repeated'.

.net: Why do you think engagement is important for digital agencies?

RS: It shifts the focus of marketing away from simple brand awareness and interruption onto a more mutually beneficial relationship for both customer and business. In the current climate, the ability to develop and sustain relationships that are based on more than just low prices can be the difference between just surviving and long-term success.

.net: What can be done to improve engagement?

RS: Be really simple in what you do. Remove every non-essential aspect of your offering. People develop emotional attachments faster and more deeply to well-differentiated and understandable things. Then, over time, deliver increased value slowly in what is known as 'The Long Wow'. Lasting engagement, like good friendships, builds gradually.

Finding redemption in segmentation

Ever since the dawn of direct marketing and latterly in the arena of web analytics, segmentation has played a critical role in understanding visitor behaviour. In terms of using web analytics data to inform decision making, average figures in web analytics are almost as useless as no data at all – but not quite.

On-the-fly segmentation isn't new in web analytics, but it is for Google Analytics. In the recent upgrade there are a number of interesting new features described by the GA dev team as "enterprise class". Google has added a custom reporting tool, motion charts that enable users to view key data three-dimensionally and over time, and, significantly, advanced segmentation.

As competition for customers heats up, looking at averages becomes an ever-blunter instrument. Understanding how different groups of visitors behave in relation to elements such as referring sources, keywords or groups of keywords and even entry pages enables marketers and site managers alike to better meet the expectations of visitors.

With online performance across marketing acquisition and website development strategy so closely tied to the ability to meet visitor expectations, on-the-fly segmentation is a key weapon in the armoury to help businesses zero in on their greatest areas of opportunity.

Google's decision to add a sophisticated segmentation feature to its free product means that the considerably enhanced level of analysis and insight made possible by segmenting web data is now freely available to businesses across the whole spectrum, from the very smallest to the largest.

Web analysis often involves disappearing down rabbit holes and following hunches that have been seeded by snippets of data, perhaps from your analytics dashboard; it's an important part of uncovering valuable insight that can make a competitive difference. The beauty of true on-the-fly segmentation lies in its dynamic nature.

Filtering sources of traffic and comparing performance levels is often the first step but rarely the last. Adding extra filters to a segment such as your entry page could help unearth insights on how to increase average order value by testing and improving landing pages. Now imagine being able to unstitch your segments and rebuild them as you advance your analysis, as well as applying legacy data stretching back to when you first started to record your web data. In a short space of time the picture can come to look very different.

Statistics: Organisational attitudes

Which of the following behaviours and attitudes do you expect your organisation will need to address in the next 12 months?*	
Sensitivity to price: 48.22%	Desire for simplicity: 36.34%
Prolonged decision-making: 31.12%	Buying and selling second-hand: 4.75%
Focus on quality: 44.89%	Purchase of luxury and indulgent items: 8.79%
Intolerance of poor customer service: 32.07%	Buying own-brand products: 7.13%
Sacrifice (family first, etc): 7.36%	Focus on short-term needs: 27.08%
Lack of supplier/brand loyalty: 30.17%	Other: 4.28%

*Respondents could check up to three options. Source: 3rd Annual Customer Engagement Survey – cScape/e-consultancy

Q&A

Name Matthew Tod
Job title Chief executive officer
Company Logan Tod & Co
URL logantod.com

.net: Why do you think people are so excited about the idea of multivariate testing at the moment?

MT: Most websites offer a pretty good customer experience nowadays, so how do you find the last incremental changes that push performance of your website higher? The answer lies in testing different elements of important pages. Multivariate testing enables you to test changing the words, the calls to action and the images on a page to find the perfect combination.

.net: How does multivariate testing relate to web analytics?

MT: Web analytics is an essential prerequisite for testing; the data in the analytics tool helps you to spot those pages that are failing and where a change in performance would make a genuine difference to results.

.net: How should people get started in using multivariate testing for their site?

MT: First you should identify the weakest pages on your website – those that leak visitors – and then implement a testing tool such as the free Google Website Optimizer. Small changes usually lead to small improvements, so test some radical ideas!

MOTION DESIGNER
AVAILABLE FOR HIRE
SENIOR WEB DEVELOPER
ILLUSTRATOR
ACCOUNT DIRECTOR

Win more clients! > How to deliver the perfect pitch – turn to page 12

Boost your career with social media

Words **Suw Charman-Anderson** is a social software consultant, specialising in the use of Web 2.0 tools in business. suw.org.uk

Image **The Ronin** Rob Chiu's motion graphics and design studio. www.theronin.co.uk

If you want to get ahead in web design and development, you need to make intelligent use of the emerging social networks, says **Suw Charman-Anderson**

While yet another mention of the words 'credit crunch' might make you want to run screaming, the truth is that times are uncertain for freelancers and the employed alike.

It's hard to find new clients and seemingly secure jobs could be gone tomorrow. But when unemployment is rising and every opening has hordes of rabid candidates battering down the doors, how do you make your application stand out? How do you find new clients in an economy where budgets are being slashed and projects iced, with economic recovery not forecast for a long time to come?

You can't predict the future, but you can prepare for it. And central to that is taking good care of your online presence. It's no secret that employers, recruitment agents and clients alike frequently type the names of potential hires into Google, just to make sure there's nothing in their profile that might embarrass the company. These days, taking care of your reputation is just as important as having your CV up to date.

Insurance policy

"It's almost an insurance policy against any kind of unforeseen future disasters," says Nancy Williams, managing director of Tiger Two (www.tigertwo.co.uk) and an online reputation management expert. "What you have online is important, because when you've got a glut of potential employees out there, you're not just going to be chosen on your CV – you've got to show them something extra."

Yet while most professionals working in the web industry will have some sort

Above Jon Hicks blogged about creating the Firefox logo and says many clients have found him because of it

Right Don't have your own site? Then use a tool such as Blogger (www.blogger.com) to host your blog for you

>> including a CV they wrote during their last job hunt. It's easy to understand why these things age: it's tedious to keep reworking a professional site or CV. But a plain vanilla website isn't enough; you need to go a bit further to stand out from the crowd.

Increasingly, web designers and developers are using blogs, professional networking sites and microconversation services such as Twitter, not just to express their professional opinions but also to widen their networks and connect with new leads.

Dust off the cobwebs

The most obvious place to start is your own website. If you haven't paid much attention to it recently, it's time to dust off the cobwebs. Not only should it look professional, but visitors should easily be able to find key information, such as what you do, your client list and your areas of expertise.

Many experts swear by blogs as a great way to get noticed by new clients or employers. "Most of my work comes via referrals and my blog," says Leisa Reichelt, a user experience designer (disambiguity.com). "I've had lots of clients tell me, when they first contact me, that they've been reading my blog for some time. It gives them a good sense of who I am, so when they hire me they feel they know what they're getting."

Your blog isn't just a place for you to showcase your expertise, it's also an opportunity for you to take part in wider conversations, either through the comments or by writing responses to blog posts.

Of course, you should take care when writing about your job or clients, and make sure you don't say anything inappropriate or breach confidentially agreements. But discussing your work can be a powerful way of attracting interest, as design guru Jon Hicks discovered when he blogged about the Firefox logo redesign.

"The Firefox post was a big thing," Hicks says. "I saw my blog stats go up incredibly and a lot of people say they found me through that. They discovered I was the Firefox guy."

Tools such as WordPress or Movable Type enable you to easily maintain your site, including static pages for client lists, CVs and project information. If you don't have your own site, TypePad or Blogger will host the blog for you.

TOP TIPS

- Think about what you'd like to write before you start your blog.
- Write regularly, even if not often. Three or four times a week is adequate.
- Read as many related blogs as you can and subscribe to their RSS feeds in a reader such as NetNewsWire or Google Reader.
- Link to other people who are writing things you find interesting.
- Join in the conversation in other people's comments and respond to your own.
- Be honest, authentic and transparent, and let your personality come through.
- Investigate desktop blogging clients such as Ecto, which make it much easier to write, especially when you're offline.

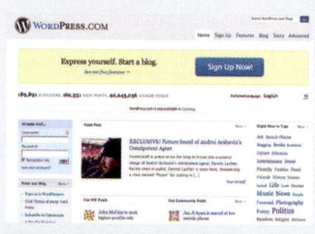
The wisdom of Twitter

Another useful application is Twitter (twitter.com), the increasingly popular service that enables you to send status updates of up to 140 characters by web, SMS or mobile web.

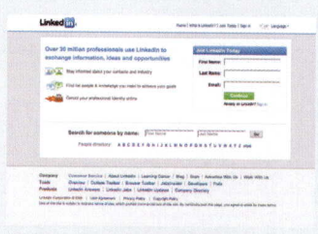
While many have characterised Twitter as the ultimate waste of time, it can be a great way of keeping interesting people in your peripheral vision.

Leisa Reichelt, who coined the term 'ambient intimacy' to describe the way Twitter and similar tools enable you to keep in touch with people by

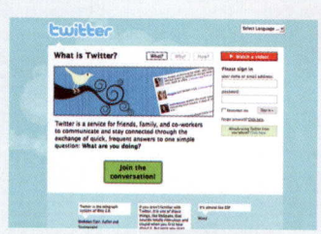
Resources Four essential career-boosting sites



WordPress One of the best blogging tools out there, you'll be up and running in just a matter of minutes with wordpress.com. If you want to host your own, download the standalone version from wordpress.org.

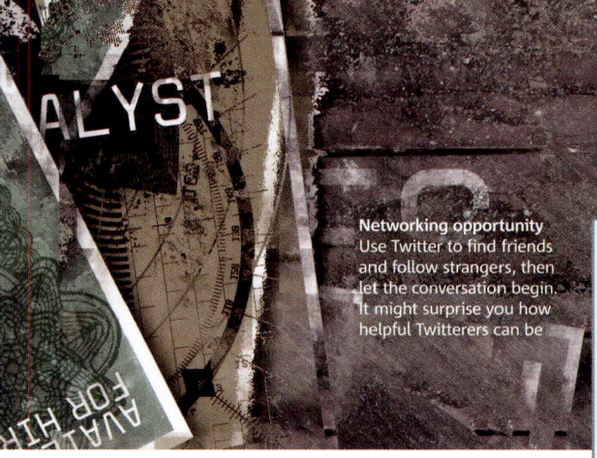


LinkedIn This site makes it easy to show your skills off to potential clients and employers. Once you've completed your profile and linked to all your friends and colleagues, find relevant groups to join and get active in the Q&A section.



Twitter Tap into the wisdom of crowds by joining Twitter. Keep your username short and set up your mobile so you can Tweet by text. When you get stuck you can ask your fellow Twitterers. Just don't let it take over your life!

Upcoming Use this site to keep on top of all the conferences, meet-ups and happenings in your area, so you know what's on when. Find your friends and see what they're going to, express your interest in an event, or promote your own.



Networking opportunity
Use Twitter to find friends and follow strangers, then let the conversation begin. It might surprise you how helpful Twitterers can be

broadcasting tiny bits of information about your life, has found it to be invaluable.

"Twitter gives me incredible access to a professional network that I would otherwise never have any contact with," she says. "Without Twitter, I would only ever know them through things they publish formally, such as books, which give some insight, but nothing like the insight you get from sharing their experiences 'in the moment'."

Once you've built up a network of friends and peers, Twitter can also be a great source of advice. "Having access to such a vast pool of talent and experience is exceptionally valuable," says Reichelt. "It makes me smarter, and I can work faster. I have well and truly made back all the time I spend Tweeting, thanks to the cleverness and generosity of my Twitter friends."

Third-party tools

A whole ecosystem of third-party tools and services has grown up around Twitter. Desktop clients such as TweetDeck and Twhirl make using Twitter easier, while photo sharing services such as Twitpic enable you to upload an image from your mobile phone and send a link to it to your Twitter account. There's a lot to explore, and it's worth taking the time to see what most interests you.

But before you throw yourself into Twitter, take a moment to think about how transparent you want to be. Some people keep Twitter focused solely on their work, others are comfortable enough to reveal things about their personal lives. Whatever you decide, don't go over the top: there are some things that the world just doesn't need to know. Don't get yourself fired or dropped from a project because of an ill-conceived Tweet.

TOP TIPS

- Keep your username short, so that you have as much of the 140-character limit as possible for your messages.
- Set Twitter up on your phone so that you can send messages to it via SMS. In some countries, such as the United States, you can also receive messages from Twitter via text.
- When you sign up, don't just look for friends to follow, but also look for interesting people that you admire in your field. Don't be offended if they don't follow you back.
- Use the '@username' convention to aim a public message at a particular person and 'D username' to send a private message (although this only works if they're following you).
- Tweet regularly, but not too often. A mix of serious and frivolous can work really well.
- Don't pimp yourself. Constantly banging on about your own achievements or posting links to your own blog can very quickly become wearing for your followers.
- Ask for advice when you need it and, if you're looking for work or new clients, don't be afraid to mention it.

Spread your wings

It sounds like a cliché, but sadly it's true that it's not what you know, it's who you know. Many job vacancies are never advertised, filled instead through word of mouth.

This is why it's important to widen your network as much as possible – if there's a job out there that's right for you, you need to hear about it first.

LinkedIn is probably the best known professional networking site, but it's also worth looking at the more European alternatives Xing (www.xing.com) and Viadeo (www.viadeo.com). Social media strategist and LinkedIn/Xing evangelist Julius Solaris (www.juliussolaris.com) says these sites have been invaluable for him. An active LinkedIn user, he has 9,500 people in his network and runs a popular events management group with more than 5,300 members. He started the group nearly a year ago and spent a lot of time promoting it, but his hard work has paid dividends. "I knew that if I got the word out about my group," Solaris explains, "companies working with events and IT would be interested, and that's what happened.

"The community grew so big that an online event ticketing services company contacted me. We worked together with the group, talking about the product and holding events all around the world."

Attract headhunters

As with Google, employers and recruitment agents use LinkedIn to headhunt. Sometimes they're overt, using Groups to find interesting people or to advertise their jobs, but they can also be more discreet, using their status line to ask for applicants to get in touch.

Equally, people looking for work often let their network know about their availability, information that can get passed on until it reaches the right person.

TOP TIPS

- Compete your profile. Provide a thorough but concise description of your previous jobs and responsibilities.
- Update your status regularly to remind your network that you exist and give them an idea of what you're up to.
- Recommend colleagues. Leaving positive testimonials not only makes you look generous, it also brings you to the attention of your colleagues' contacts.
- Join groups. Find groups that cover your areas of expertise and interest, and participate in and initiate discussions.
- If there are no groups covering your field of expertise, start one yourself.
- Take the opportunity to ask and answer questions. Q&As are not only a great way to gain the benefit of your network's collective intelligence, but also an

>>

Getting started

Getting on top of your online reputation might feel overwhelming to start with, but if you break it down into smaller tasks, it's really quite manageable.

- Find out what information about you is already online. Search for your name or your company's name in Google and take a good look at what's out there.
- Set up alerts in Google News and Google Blog Search and subscribe by RSS or email. Use quotation marks around specific phrases in searches and the minus sign to exclude a term.
- Start blogging. If you have your own domain and hosting, then install your blog there. If not, use a hosted service and you'll be up and running in no time. Try to post at least three times a week.
- Join LinkedIn or Xing. Get your CV online using these professional networking websites, then find your friends and colleagues, or send invitations to people who aren't there yet. It's best to spend a little time each day developing your network, rather than saving it up for a big session at the weekend.
- Find communities focused on your area of expertise. Look for forums, blogs, LinkedIn or Xing groups, Ning networks and events relevant to your career.
- Go to events. Conferences, BarCamps, meet-ups, Tweet-ups – the world is full of events and many of them are free. Don't be afraid to go on your own: most people are happy to chat to a stranger. When you collect business cards, jot notes from your conversation on the back to remind you who they are and add them to your LinkedIn or Xing network when you get home. And don't forget to take your own business cards to hand out.

> "Having access to such a vast pool of talent is exceptionally valuable" Leisa Reichelt

- opportunity to demonstrate the depth of your own knowledge.
- Add new contacts to your network as soon as you can after meeting them so that they don't get lost in the dusty corners of your memory.

Old school

There are so many opportunities online that it's easy to forget how useful offline can be too. Put your blog's URL, Twitter username and your professional profile's URL on your business cards. Moo (www.moo.com) provides high quality but cheap cards in varying sizes that are fully customisable. If you're a designer, consider putting examples of your work on a photo sharing site such as Flickr and then using those images on the back of your Moo cards. Also, search for smaller communities that are focused on your area of expertise, whether on forums or even mailing lists.

"Good old-fashioned email lists are still important in my line of work," says Leisa Reichelt. "It can be quite time-consuming to keep up, but I've seen them used very successfully by people in my peer group to help build their reputation. For example, any user experience person worth their salt should know about the IXDA mailing list."

Be prepared to get out to meet-ups, conferences, user group meetings and other events. Talking to someone face-to-face can be a good way to cement an existing online relationship, and meeting strangers in person can give you whole new avenues to explore online.

Dealing with critics

There can be a downside to all this: the more visible you are online, the more likely you are to attract critics, some of whom can be quite vociferous. When that happens, Nancy Williams says, "the first thing people do is panic, but it's vital you avoid a knee-jerk reaction". Instead, she recommends you look objectively at the criticism and try to understand what's behind it. If there's something you can do to rectify the situation, do it.

"Apologies can do great things for your reputation, as they show honesty and a willingness to take responsibility for mistakes or misfortunes," Williams adds. "But if you think someone's just out to cause trouble, be careful how you respond.

"In that case, getting into a debate is generally not the best way to handle things. All you can do is try to build the bigger picture. Address it head on in your own blog, if that's appropriate, but try to avoid getting into a flame war, because that will damage your reputation. Sometimes, if it's a troll, the best thing to do is to ignore it."

Break it down

On paper, starting a blog, joining Twitter and putting your profile on LinkedIn doesn't sound like much, but the key is to fully engage with not just the tools, but your community.

A half-hearted stab at it won't help. Solaris admits building your profile can be hard work, but believes it's time well spent.

"If you ask me, 'Is there a magic trick?' I don't have an answer," he says. "But I do know every little counts and you need to be proactive."

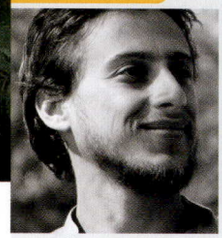
It will also help your future clients or employers if you aggregate everything. Your blog should be the centre of your online universe, so pull in your Twitter stream to the sidebar, link to your LinkedIn profile and list the communities that you're part of. Bringing your entire professional online presence together will make life easier for others and probably help your ranking in Google too.

But if it starts to feel overwhelming, just break it down into bite-sized pieces and do a little bit every day. Try to make it part of your routine, as habitual as your morning coffee or checking your email. Once you've embedded it in your life, you'll barely notice it's there. ●

> "Sometimes, if it's a troll, the best thing to do is to ignore it" Nancy Williams

WWW. *Have you found social networking success? Discuss your experiences at forum.netmag.co.uk.*

Case study



Premasagar Rose: director, Dharmafly

Twitter is turning into an essential tool for freelancers and employees alike, enabling them to find out about jobs that may never otherwise get advertised. Those who are discovering that serendipity can be invaluable include Premasagar Rose, director of Brighton-based web agency Dharmafly (www.dharmafly.com).

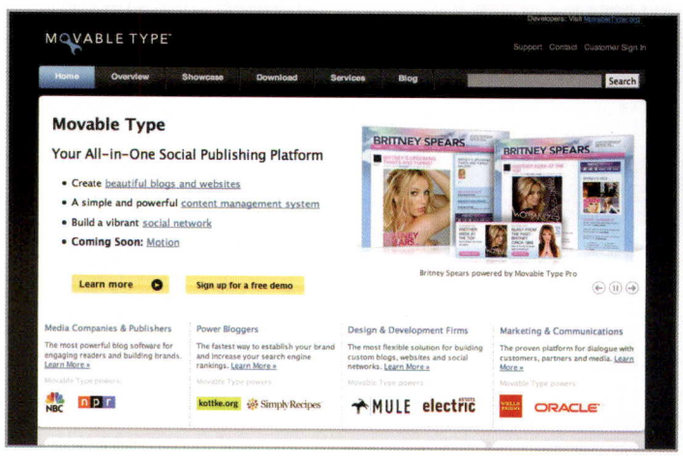
"One of our biggest web development projects to date came via Twitter," he says. "A large British media company was in a tight spot, with a deadline looming and its team at full capacity. Then came the Tweet: 'Looking for someone to do some JavaScript mashup work.'"

Rose had already met the Twitterer in question at a hacking competition, but says they didn't know each other that well. "He wouldn't have thought to ask us directly," he says, "and without the Tweet, we would never have heard about the job."

Rose replied immediately. The client checked out the Dharmafly website and blog and got in touch to talk about some of the technical requirements. At a meeting the next day, Rose met the team and helped them refine their plan, as well as contributing new ideas. After sending a quote and technical specification, Dharmafly got the go-ahead for a hectic 12 days' work.

"The project received great feedback and ultimately picked up a couple of awards." says Rose. "It's turned out to be a defining moment in Dharmafly's development. We were only six months old at the time, but this opportunity became a springboard for us, helping us grow throughout the year that followed."

The project turned out to be the beginning of a long-lasting relationship between Dharmafly and the client, who have gone on to do further work together.



Above Social media strategist Julius Solaris is founder of the Event Planning & Management Group on LinkedIn

Left Movable Type supports static page generation and dynamic page generation, or a combination of both

Kirsty Shields on...

Blogging about brands

There's a clear etiquette to using social media as a marketing tool – ignore it at your peril, warns **Kirsty Shields** of MWorks

With so many people writing their own blogs, pretty much everything is now being talked about online. There'll be someone out there who genuinely cares about your brand or product, and who can help to make more people excited about it. This is why brands are increasingly turning to blogger advocacy to fuel word of mouth in social media.

This was the driving factor behind the campaign we created for the government-funded Creative Choices website, which aims to help people get into the creative professions. Six key figures in the creative industries were hired to blog on the Creative Choices website and then to amplify their posts around their various social media outlets, thereby driving traffic and awareness for the site.

However, blogger advocacy is a delicate area, and there is a definite etiquette. Brand information has to be presented properly so it's not perceived as advertising, but as a useful contribution to the conversation online.

Blanket-commenting on things that are barely relevant will have a negative effect on the brand. Effective blogger advocacy is about finding people who are talking about your brand then actually listening to their conversations and adding to them.

> "Brand information has to be presented properly so it's not perceived as advertising" Kirsty Shields

Sourcing the right bloggers is critical. If you don't have the contacts, this can be a tricky process, but there are agencies that make a living out of being well connected in the blogging community, such as Cheeze and Talking Voices.

You need a clear set of criteria when it comes to recruiting your bloggers; they need to be relevant to your subject, to have a significant online sphere of influence, be active in a wide range of social media and crucially they need to be talented, engaging and credible writers.

Blogger advocacy raises ethical questions, which is why transparency is important. Once you've hired your bloggers it's essential they disclose that they're being paid to write on your behalf. At the same time, they must have the freedom to write about what they want. You can give them a good brief, but you have to leave them to it.

For many brands, relinquishing control in this way is not an easy process. But the reality is that these conversations are happening with or without you. If you get involved, you'll find people that love you, others that don't and some who aren't sure. Joining in means you can listen and react accordingly, which allows you not just to fuel positive conversations, but also to tackle any negative comments. By listening, understanding and addressing any issues, you can turn these conversations around to your advantage.

Finally, before embarking on a campaign like this, you need to ensure that your website is user-friendly, works correctly and that the registration process is simple – particularly if the campaign is being used to drive traffic and registration.

Blog posts need to be written in a way that encourages comment and exploration of the rest of the site; otherwise you'll see a noticeable drop-off in visitor rates once the campaign is over.

Finally, you need to ensure all the relevant tools and icons are on the page to enable readers to post pages to social bookmarking sites.

While these may all seem obvious points, it's imperative to cover off all bases before rolling out a blogger advocacy activity because, unlike other forms of marketing, this kind of campaign cannot be put on hold halfway through while you fix problems. It has a snowball effect and momentum builds over time, so brands need to make sure that they are ready in every way, and are happy to see it all the way through to its conclusion to provide the best chance of success.

Blogger advocacy is a cost-effective way of creating a far-reaching campaign. There are no development costs involved beyond recruiting and managing bloggers. And it's easily measurable through Google Analytics.

For example, for Creative Choices we know that the campaign generated almost 20 per cent of the site's overall traffic across the three-month period in which it ran. On top of this, 82 per cent of the links in to the Creative Choices site across this period came from the bloggers' posts; social media channels contributed over eight per cent of the total referred traffic; and the activity generated over 42 per cent of the amount of traffic Google generated to the site across the same period.

Kirsty Shields is account planner at digital agency MWorks (www.mworkslondon.co.uk), part of McCann Worldwide. Part of her role is to help clients understand how social media can be used effectively.

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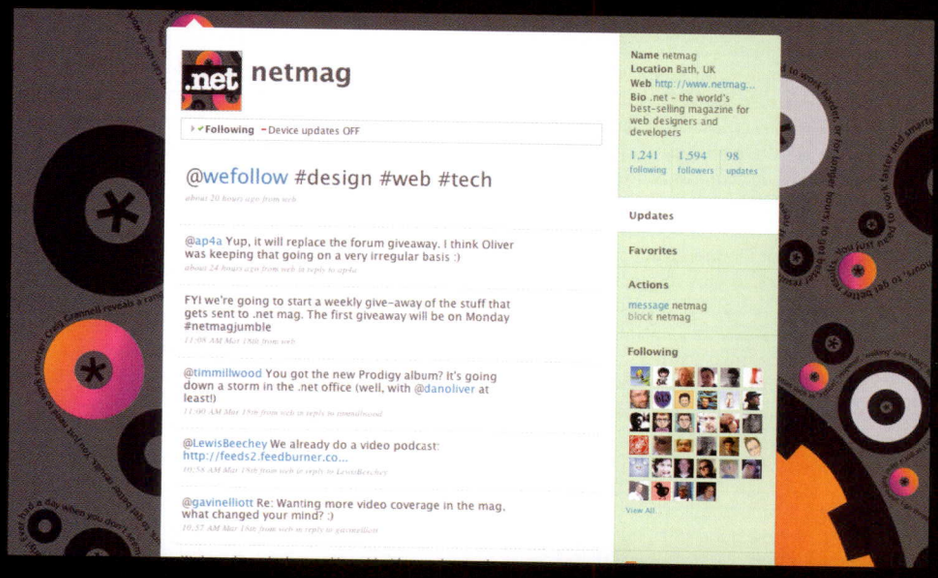

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New to Twitter? Find people with shared interests using **TWITTERSEARCH** (search.twitter.com). Once Twitter starts taking over your life (it will), use **TWEETDECK** (tweetdeck.com) to break it down into manageable bite-sized pieces.

Usman Sheikh on...

Email marketing

Brilliant UK's **Usman Sheikh** explains how you can drastically increase your email campaign response rates

Email marketing, as we've all come to know, can be an efficient and cost-effective method of communicating with existing and potential customers. Running an email-based campaign enables us to personalise our message along with the ability to track the user response once they've received it.

Unfortunately, this ease of distribution is also the reason why there's an unprecedented amount of spam circulating in cyberspace. In 2008, according to a report by Secure Computing, more than 150billion spam messages were sent each day, with the "largest member" of this group, ironically, being male enhancement products.

With spam comes anti-spam software and with that comes the blocking of legitimate emails. As a digital agency, we regularly get asked the question: "How can we make sure that our emails always get delivered?" As much as I'd love to have a definite answer, unfortunately there isn't one. However, by following some simple rules you can drastically increase the chances of your emails not only being delivered but also getting a higher response from your recipients.

First things first...

To start with, you need to assess (and reassess!) your mailing list. If you're collecting user data on your website, make sure you always use double opt-in. A double opt-in simply means that when someone signs up to your mailing list, they receive an email containing a link they must click to confirm their sign-up. This will stop illegitimate and dummy email addresses from being added to your mailing list. Naturally, if you're sending an email to someone who wants to receive it, they'd be more open to what you have to say in it.

Apart from using double opt-in, you should always proactively manage your unsubscribe requests and bounced emails. If you continue to send emails to non-existing email addresses, it might result in ISPs blocking and blacklisting your domain as a probable spammer. The Internet Engineering Task Force (IETF) also recommends that you should have abuse@ and postmaster@ email addresses active on your domain. These email addresses are generally used by ISPs to get in touch with you if they receive a complaint or spam report about your mailings.

Design for life

A good design is key to any successful email campaign. A simple, more focused design is much more likely to get a response from the user than a busy and confusing layout where you're trying to fit too much into a small space. Keep in mind that most people these days use preview panes in their email clients, which means that only a small part of your email will be visible by default. Irrespective of the position of the preview pane, the top left of the email will always be visible, so make sure you make the most of it and have something interesting there.

If you send out regular campaigns, try to ensure that the overall layout of your email is consistent in each issue. This not only reinforces your brand but also reduces the learning curve for the recipient. With each issue readers will know where to look for the featured article, where the special offers are, where the contact details are and so on.

Timing

Again, if you're sending out regular campaigns, make sure you send them at the same time, on the same day. This way the user will begin to look out for your email and be receptive to what you have to say. Online research analysts suggest that the best days to send a mail out are Tuesdays and Wednesdays, as people tend to be more receptive to receiving communication.

Overall, you need to keep in mind that having an email marketing strategy that works for you is a matter of trial and error. Try playing around with the elements I've touched on in this article to see what gets you the best response.

Usman Sheikh heads the London-based digital agency Brilliant UK (www.choosebrilliant.com), where he's involved in various digital marketing initiatives.

> "Research suggests that the best days to send a mail out are Tuesdays and Wednesdays" Usman Sheikh

WEB PRO

Marketing

Gain visibility online by exploiting blended search results, and devise a strategy to minimise unsubscribers, says **Dave Chaffey**

Optimise your site for universal search

Web users love video. In 2008 the number of YouTube videos viewed per day passed the one billion mark. Google has recognised this and for the past two or so years has incorporated videos within the natural results as part of what it calls its "universal search" strategy. As you'll know, blended results may incorporate video, images, local maps, stock prices, books and featured products from Google Product Search.

So what's the potential for gaining visibility through blended search? Some have got a little carried away, I think.

In January 2008, a Forrester analyst exhorted marketers to pay more attention to video optimisation in a blog post titled "The Easiest Way to a First-Page Ranking on Google".

While I would agree with the sentiment that it's worth performing optimisation of assets such as video and images, it's not going to be that easy.

Remember that universal search results are not universal within Google's results page. An analysis by Comscore showed that only 17 per cent of searches contained universal results within the first page.

The research also showed clickthrough rates were lower on results pages containing universal search, perhaps suggesting some form of "universal search blindness" compared to text results.

But here's one success story. Search commentator Mike Grehan says that for the 'long tail', search for a conference. SES London videos are prominent since he's been promoting them to his contacts, encouraging them to view and rate them (and views and ratings will naturally help ranking position).

I personally believe the main value of videos is engaging site visitors either to entertain or inform, but if you have gone to the effort of shooting the videos it's clearly worthwhile doing some basic Digital Asset Optimisation – check out the specialist blog ReelSEO (www.reelseo.com/15-tips-video-seo) for the latest techniques.

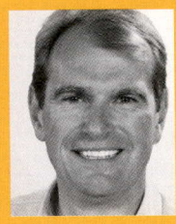
If you have extensive videos it's also worth considering Google's Video Sitemaps, which enable webmasters to provide a title and description for all videos.

What's the potential for visibility? Some have got a little carried away

Statistics: Top UK online video properties*

Property	Videos	Share (%) of videos
Total internet	3,500,627,000	100
Google sites (including YouTube)	1,681,887,000	48
BBC sites	42,417,000	1.2
Fox Interactive Media	29,748,000	0.9
Microsoft sites	25,287,000	0.7
Yahoo sites	19,975,000	0.6
Dailymotion.com	15,590,000	0.4

* Ranked by videos viewed in March 2008. Source: comScore Video Metrix (tinyurl.com/67haz2)



Q&A

Name Charlie Blackburn
Job Co-founder BrightTALK
Company BrightTALK
URL www.brighttalk.com

.net: What are the marketing benefits of webcasts?

CB: They're brilliant for engagement marketing. The best webcasts we run will attract over 2,000 registrants. The cost-effectiveness and time saving is massive, and we know people are hungry for useful knowledge. Our marketing clients love the fact they can have longer conversations with customers and prospects, all on an 'opt-in' basis.

.net: How can webcasts best be integrated into a marketing campaign?

CB: They're best used as an integrated part of regular marketing campaigns. We're seeing BrightTALK channels being embedded in social media tools such as Facebook, LinkedIn, Twitter, industry blogs and company websites. The other main tool is email which, if targeted well, is still effective.

.net: What information can you give to clients on how well their webcasts are working?

CB: Webcasting is highly measurable. Engagement is measured to the nearest second and attributable. People are happy to register for live events, so we can tell clients which customer or prospect engaged with them.

Dealing with the emotionally unsubscribed

The relatively low unsubscribe rates to e-newsletters and other permission-based email marketing have always surprised me, since they're usually way below one per cent. But why don't more people unsubscribe?

The latest figures from the Direct Marketing Association show average unique open rates and click rates for house lists at around 22 per cent and eight per cent. These are amazingly high figures considering the time we spend processing legitimate email and spam. But since I started reviewing open and click rates of individual email campaigns I've wondered what the picture would be like across a year and whether different list members are interacting with emails, or if it's just a resilient core.

Recent research by Redeye has shed light on the importance of 'emotional unsubscribes' – list members who don't unsubscribe, but who don't open or click on an email either. Redeye estimates that you can expect around 60 per cent of subscribers to be inactive over a six-month period.

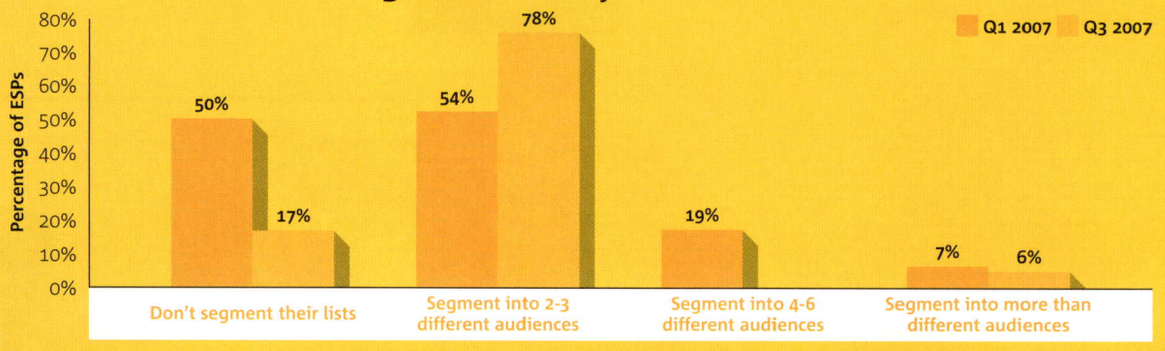
As such, you need a strategy to engage your email subscribers. First, you have to get the content right. Successful e-newsletters need to nail the balance between selling, informing and entertaining in order to keep list members engaged. You need to do your research using click data or traditional surveys to determine what's popular with subscribers, and think about making your email Web 2.0 by including more customer interactions such as comments, polls and ratings.

Then consider a more strategic approach to email communications involving what I call 'right touching' – a more granular, contextual approach to targeting and touch strategy using email and traditional media based on the list member's position in the life cycle, their recent web and email interactions and latency. If you're treating customers who've recently subscribed, clicked or purchased the same as others who have been on the list for years, it's no wonder they're unsubscribed – that's why there's room for a more refined strategy.

Dave Chaffey (davechaffey.com) is an internet marketing consultant, trainer and author.

Make your email Web 2.0 by including comments, polls and ratings

Statistics: Level of segmentation by email marketers



*Source: Direct Marketing Association National Email Benchmarking Report (www.dma.org.uk)

Q&A

Name Bill Flitter
Job CEO/founder
Company Pheedo
URL pheedo.com

.net: How did you get into RSS advertising?

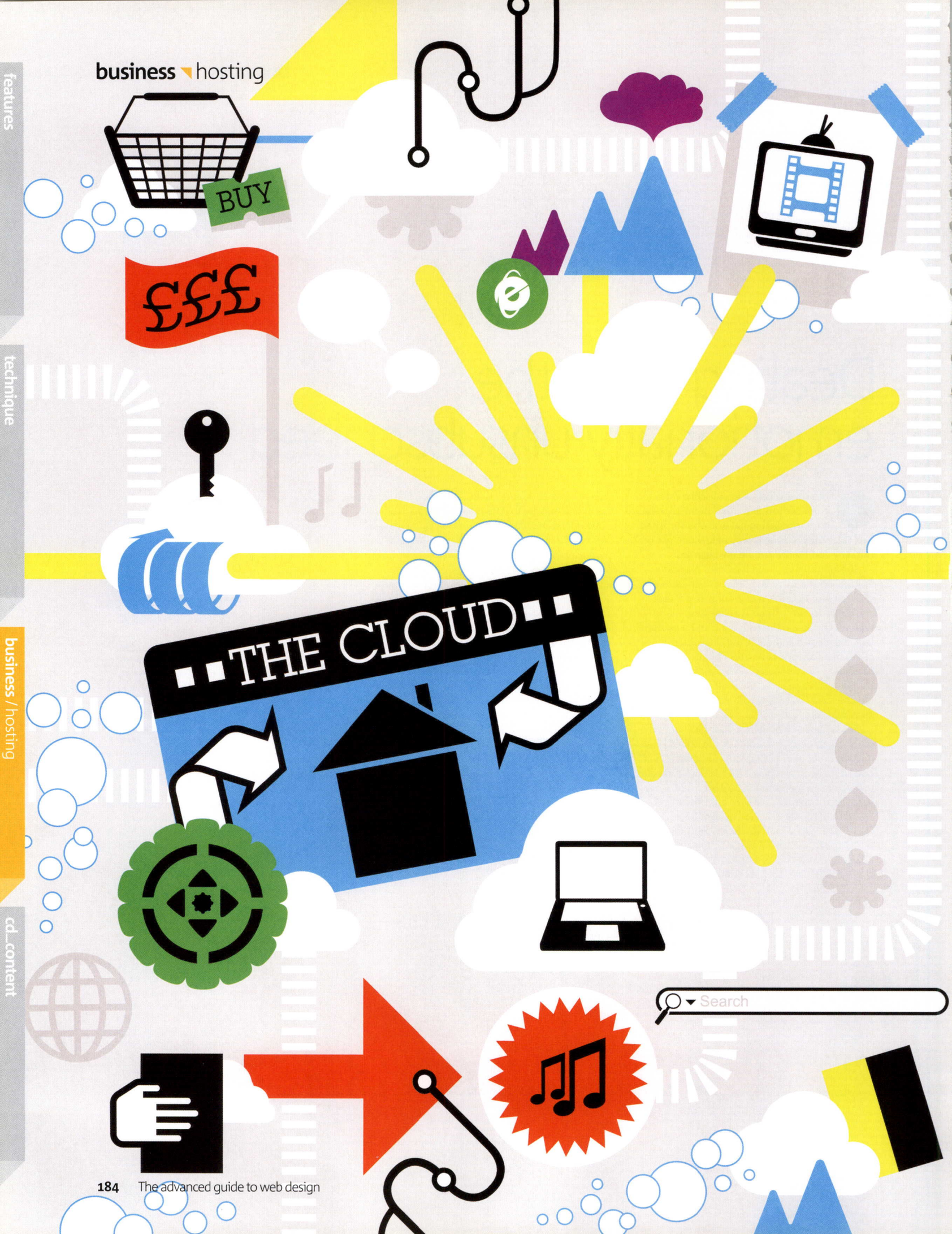
BF: Before starting Pheedo, I ran an email marketing company, which I sold in 2001. Response rates dropped and legal issues made it too difficult just to communicate to customers. I thought there had to be a better way to get consumers what they wanted. Pheedo was born out of this need.

.net: Which audiences will RSS advertising work best for?

BF: Some of our top consumer tech and news publishers see more traffic in their feeds than on their site. An Avenue A study indicated 53 per cent of online users are consuming RSS. Increasingly, consumer-packaged goods companies, car makers and movie studios that target mothers and general consumers are taking full advantage of the benefits of on-demand content tailored to individuals.

.net: How much does it all cost?

BF: The average CPM in 2007 was $5. Rates have increased 28 per cent in 12 months as media buyers have come to appreciate the potential of reaching the content aggregators and broadcasters. RSS is a personalised medium and highly targeted, so expect prices more in line with premium inventory rates.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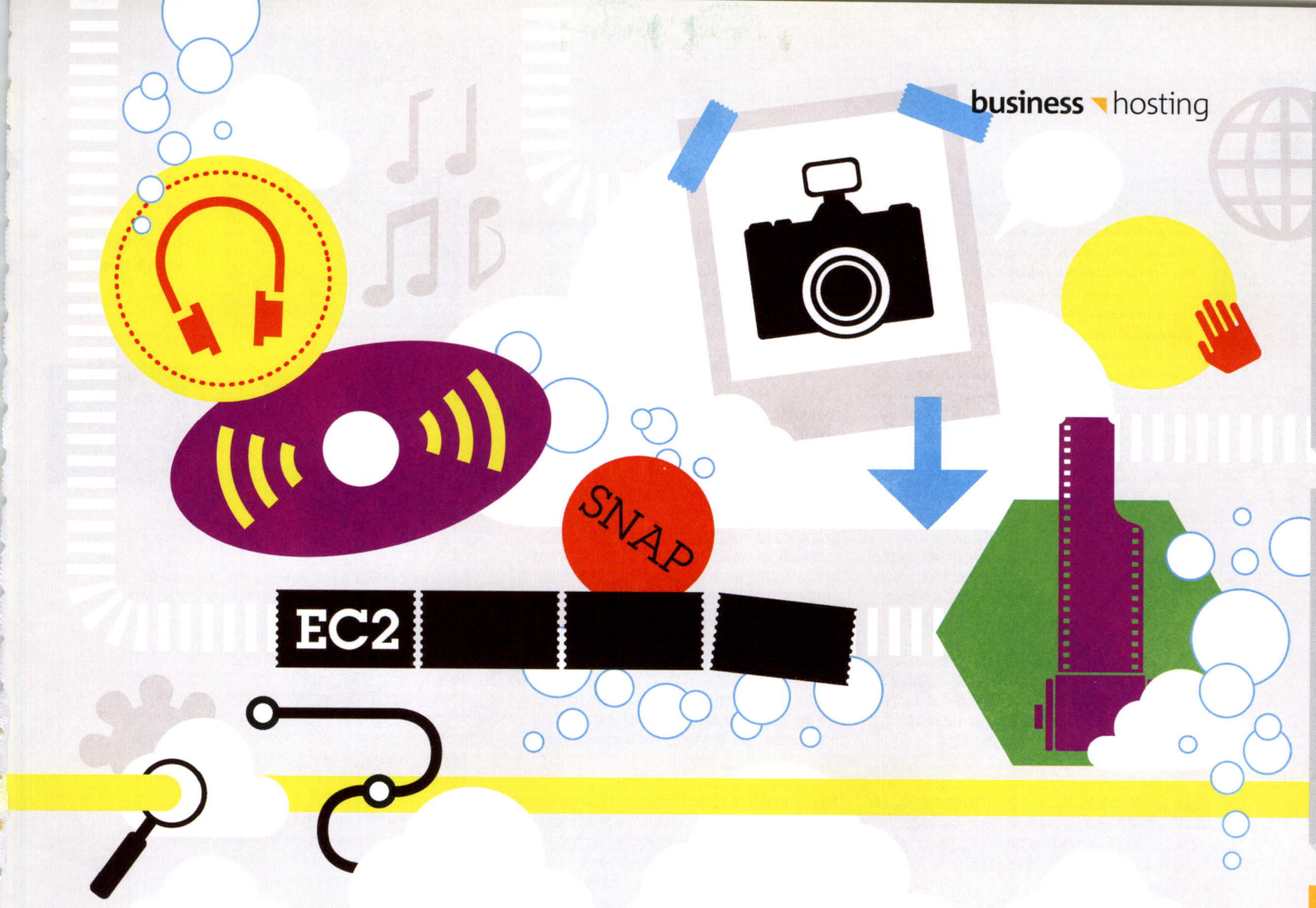


Make cloud computing work for you

Forget blue-sky thinking: where it's really at is in the cloud, says **Tim Carr** of 3ev

+ **Words Tim Carr** has worked in the web industry since 1995 and is the founder of 3ev. www.3ev.com

+ **Image ilovedust** is a studio providing creative solutions for print and web. www.ilovedust.com

As I sit writing this feature for your perusal, I'm listening to a nice little Spotify playlist that I made at home on the weekend. I didn't have to bring it to work on my iPod, or burn it to a CD – I can access it from anywhere I choose. I don't actually own any of the music on the playlist, but I can share it with anyone I like. Pretty amazing, eh? And by the way, I happen to be writing this feature in Google Docs, which means I don't need to buy any expensive word processing software and I can work on my document wherever I like, on whichever computer I like. Incredible.

It's a good example of how cloud computing is quietly taking over the world and changing the way we use our computers forever. Whether you're storing your photo collection on Flickr or logging on to Gmail, everyone's now using the cloud, even if they don't realise it. But how does it work and how can we as web designers and developers make it work for us?

Cloud computing runs on virtual servers. Rather than being a single physical box, a virtual server runs as part of a physical box. This type of virtualisation is nothing new and has long been a cost-effective entry-level solution. Virtual machines on the cloud run on clusters of servers. Again, this is nothing new: most medium-to-large server set-ups involve clustering. The big difference with cloud hosting is that it packages all of this up so that it's 'Hardware as a Service' – the clustering, virtualisation and resilience are all a given. The virtual server on the cloud runs across many thousands of servers, in different data centres in different locations: an entire 'cloud' of servers.

In terms of server architecture, this looks like an obvious progression. In terms of users, developers and business, the implications are as big as the cloud itself. The move to cloud hosting requires a shift in mindset similar to that when stepping away from apps stored on your own machine to those managed on the web. In the same way that Google Docs means you no longer have to install

The cloud and the law

Struan Robertson, legal director at Pinsent Masons LLP and editor of out-law.com, outlines your responsibilities regarding data in the cloud

The main legal issue with cloud computing is when your data includes personal data, such as users' email addresses. If you move that data to a server outside Europe (even temporarily – such as when using a US-based supplier to run an email campaign on your behalf), or when you keep a backup of your database on a mirror server based in, say, Taiwan, there's an overseas transfer of personal data.

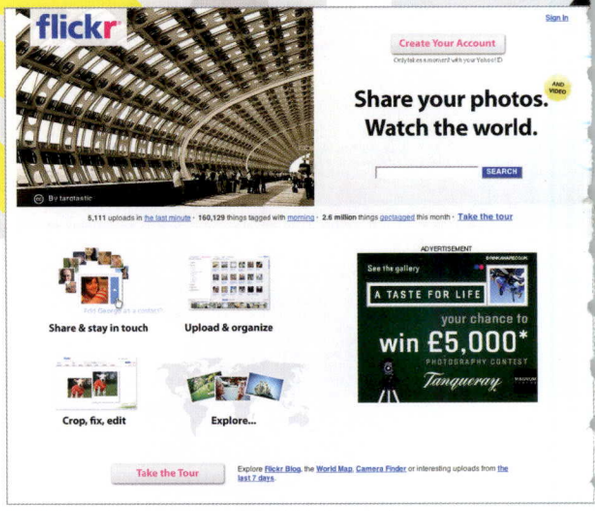
The Data Protection Act presents options for making that transfer legal. For a US transfer, the simplest option is to use a supplier that's registered with a scheme known as Safe Harbor. If the supplier isn't registered, or if the transfer is to another non-European country, the best option is to ask the supplier to enter into something called a model contract.

The other party to that deal is likely to be the owner of the data – so the UK web designer's client, rather than the web designer. You can find out more about overseas transfers at www.out-law.com/page-8169.

The other issue with hosting data both here or abroad is that authorities, if determined, can look at it. Usually, law enforcement needs a court order to do this, so it has to explain to a judge why it's needed. The server farm will then open its doors to the authorities and you'll never know about it.

Most bank transfers of every person in the UK will have been examined by a US Treasury computer, checking for criminal activity. That's because the US Treasury obtained a subpoena from a US court a while back that gave it access to a US-hosted mirror server that contained details of bank transfers from European accounts. (Read about the Swift case if you want to know more: www.out-law.com/page-7518.)

When you're using cloud services on behalf of clients, the main issue to consider is whether personal data is involved. If so, you should find a means of compliance, such as Safe Harbor. If it's likely that authorities will take an interest in the data, the client may need to consider notifying customers, such as in the privacy policy on the website. For most sites, the authorities are unlikely to have any interest. Financial transactions are in a different league, though.



Public image Photo hosting website Flickr, launched in 2004, stores more than three billion pictures on the cloud

Microsoft Word, and Spotify means you can listen to music without downloading it from iTunes, with cloud hosting there's no longer a need to lease a server: you can use as much or as little as you need.

Hosting on the cloud

The big player bringing cloud hosting to the masses is Amazon Web Services (AWS), and its timing couldn't be better. Economically, we're living in uncertain times. When it comes to upgrading a 12-month hosting contract or trying to justify another capital expenditure in terms of new hardware, painful decisions need to be made. But with cloud computing, there's less need to worry. Because you pay for what you use, rather than having to buy upfront what you think you only *might* use, cloud hosting provides the ultimate pay-as-you go hosting solution. Rather than compromise on performance or scalability, you can just host on the cloud ...

As Amazon's CTO, Werner Vogels, put it: "Anything is crappy, whether it's your hardware, your network, your operating system. Don't let anyone tell you that this stuff is unbreakable; if you have enough of these things sitting around, they all break all the time." This is the philosophy with which the Amazon infrastructure has been set up.

As such, AWS cloud hosting is set up over 19 different data centres globally, each with different power connectivity, internet connectivity and geographical location. What happens if one of these data centres goes down? Well, they do go down all of the time: Amazon pulls the plug on one of its data centres monthly, as a real-life rehearsal of what would happen in a fire.

In the old days, many a CTO used to think that the safest place to keep a server was in the office: that way, security could be ensured by fixing the latest in window locks and alarms and ensuring the night security guard had enough coffee. Of course, this approach was about as resilient as keeping your hard-earned cash under the floorboards. The next approach to hosting security was to put your server in a data centre, with managed security and support. This approach has proved sufficient for many, but it's as limiting as putting all your money in a bank. And as we've all become aware recently, having all of your savings in one bank is something to be discouraged – if it goes down, so does your business.

Now imagine putting each one of your pounds into a different bank account. If you did, then should one of the banks fail, you'd carry on as normal. The same can be said for cloud hosting.

Developing on the cloud

At 3ev, we approach cloud hosting with enthusiasm, because essentially it enables our techies to get their hands on as many servers at any one time as they like. Previously, we had a couple of collocated live servers for all of our hosting requirements, and setting up an additional box to test something out on was painful, both in terms of expense and time. Additionally there was a certain level of commitment involved: we'd have had to have that server for a minimum

Scale of the century Tools such as Right Scale will scale your EC2 cloud up and down based on selected factors

How safe is your data?

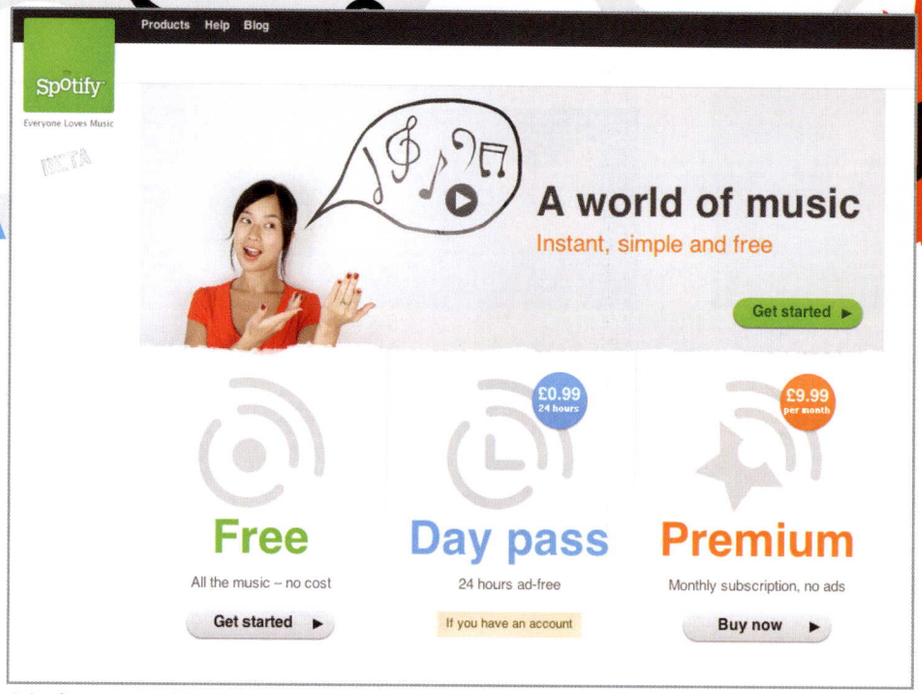
Symantec's Con Mallon addresses the security implications of cloud computing

Storing information on the cloud naturally provokes fears that the service you're using may collapse and lose all your data. In March, *The Boston Globe* reported that online backup and storage provider Carbonite had lost the data of 7,500 customers due to faulty hardware. Although this claim has been vigorously denied by the company (tinyurl.com/c3fvcd), such allegations speak to the deep-seated misgivings of many people concerning cloud computing.

The other side of the equation, however, is that cloud-based backup is a reality and necessity, and is working flawlessly for customers across the world. We at Norton have been managing many petabytes of data for customers within N360 for two years, and have now built upon this to bring NOBU (Norton Online Backup) to market.

Do you really know where all the USB thumb drives you use are at this moment in time? The CD and DVDs you've backed up onto, could they be getting scratched or gathering dust as they line a drawer? The external hard drive is just as exposed to being knocked, lost or stolen as anything else. Online backup and storage decreases the risks of all these factors.

For cloud-based backup to continue to grow, the hardware and software used must be optimised. Layered on top of this must be a focus on data resilience and replication, to help counteract the unexpected. Finally, the effective and professional management of the data centres where all of this is stored is vital.



Going for a song Swedish website Spotify offers users the chance to listen to music for free on a peer-to-peer streaming basis. The site was launched in October last year, though the free version is only available in parts of western Europe

of a month, when often we'd just want to set something up for an afternoon.

Nowadays, on the cloud, the virtual machines look just like normal servers. You can ssh in, move stuff around and even install software. So what's actually different? First, it's brilliantly easy to take snapshots. You can take a snapshot of your data at any time you like and, because you can buy as much storage space as your requirements dictate, you can just keep going.

Working with this level of agility means that if one of your sites needs some immediate and risky maintenance, this is easier than ever before. You can instantly clone it onto a new server – and work on the clone – in the "live" environment. With the cloud you always have spare servers sitting around, should you need them.

Scaling on demand

If your app or site hasn't been on larger infrastructures before, you'll need to make sure it can scale well. Dedicated hosting tends to encourage coders to build for a fixed number of machines, but cloud hosting needs a more scalable approach. If you're scaling on demand, the number of machines can shrink and grow automatically, so your app needs to be able to cope with this from the ground up.

This is a big area, so the best approach is to fire up a few instances on EC2 and find out whether it scales. It's possible to rehearse for any eventuality, which is useful when running sites and apps prone to spikes in traffic. Test instead of guess.

This ability to rapidly scale your application and have the privilege to instantly throw dozens of servers at a problem aren't things that anyone had the luxury of until cloud computing became available. The cost of scaling at short notice is also surprisingly cheap.

Amazon provides backup onto the cloud through its S3 service (Secure simple storage). Rather than backing up your data once, S3 makes six copies, all in different locations on different hard disks. S3 can be combined with EC2, meaning that you can turn servers on and off with unprecedented ease and can cater for any eventuality, both planned and unforeseen. Cloud hosting makes it entirely possible for serious e-business to be within reach of any developer with ideas.

The set-up cost of a cloud server running on Amazon is 10 cents plus a valid credit card. From this initial set-up, you can scale up to running many, many different instances of the server – with no additional lead time or further contracts to delay the process. The implications of this are already benefiting a large number of businesses that, without this low cost of entry, simply wouldn't exist.

For instance, in December 2007 the social networking games company Playfish launched a game called Who Has The Biggest Brain? Since then Playfish has grown exponentially. It's currently responsible for most of the top ten games on Facebook and provides games to more than 50million users. Scaling an operation such as this using a traditional set-up would have been prohibitively expensive and unreliable. With user numbers increasing by up to one million in the space of 24 hours, there would have been moments of poor service and downtime where the infrastructure just couldn't cope. Not only did cloud hosting make the initial outlay affordable, it made the entire solution more agile and made scaling more responsive.

The traditional way of scaling often either over-caters or under-caters for demand. The lead times involved in setting up, getting >>

The traditional way of scaling often either over-caters or under-caters for demand

Get started on the cloud

To try Amazon's Web Services, you'll need an Amazon AWS account. Start at aws.amazon.com by clicking 'Sign Up Now' and following the instructions. You'll need to fill in your email and your address. Starting with EC2, go to aws.amazon.com/ec2 and click the 'Sign Up' button. You'll now need to enter your credit card details, but you won't actually be charged anything until you start using the servers.

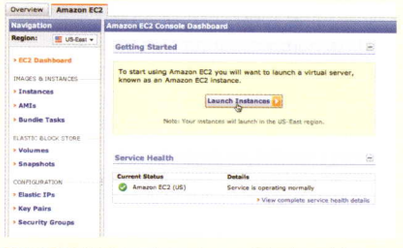
If you're a Firefox user, the ElasticFox is a great way to control your EC2 account via a single interface. You can see all your running instances, all your machine types and all storage in one interface. Get ElasticFox by going to tinyurl.com/2rdgqa and following the installation instructions.

Alternatively, you can use the AWS management console at https://console.aws.amazon.com, which provides some of the same functionality as ElasticFox. Once you have one of these ready to go, you can fire up your first machine on the cloud.

If you're using the management console, just click Launch Instances and then select the LAMP Web Starter from the dialog box. Follow the instructions to create a keypair and make sure all connection methods are checked. Unless you have some big numbers to crunch, start just one instance in the Launch step. When you've finished this process, click to go to the Instance page.

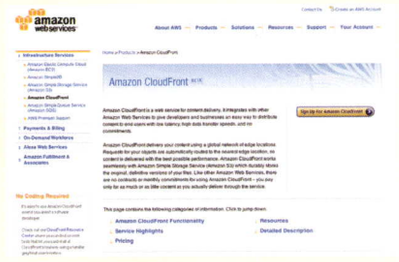
After a few minutes, you'll have a running machine. To see the results of your efforts, copy the public DNS into a browser. This isn't mindblowing, but if you ssh up to the machine you'll be able to move around it as though it were a normal server.

And that's it: you have a machine on the cloud that you can do anything with. Try installing WordPress or any other piece of software and you'll find it eerily familiar.

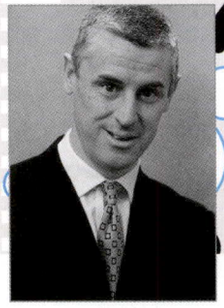


Get going Once you've got your virtual machine running on the cloud, the sky's the limit

Amazon's cloud services



- **Simply Storage Service (S3)** was built when Amazon realised most data access just needs 'key – value' access, rather than complex databases. Store tonnes of data here and get at it from anywhere.
- **Elastic Compute Cloud (EC2)** is your very own server farm, but on a bigger scale. With 19 points of presence globally, you can build your own huge number cruncher or just be a little less worried about your data centre flooding.
- **Simply Query Service (SQS)** is like magic. One thing puts a task on the list, another takes it off. This allows you to scale your application by making each part work independently. It's a big list.
- **SimpleDB** provides a hugely scalable database for situations when S3 just won't do. Although you can run MySQL and other relational databases on EC2, SimpleDB provides a bit of muscle.
- **CloudFront** is all about getting stuff to users. If a million people hit your app in America and a million hit it in Europe, where should your server be? CloudFront acts as a cache that's geographically near your end users, making the app faster.
- **Mechanical Turk** is people on the cloud. Need a human? The Turk provides an API to humans for tasks that humans can do better, such as identifying whether a particular picture contains a house.



Confident Con Mallon of Symantec believes cloud computing makes your data more secure, not less

Gamesmaster Playfish claims to have 22million registered users who are driving two billion minutes of engagement per month

>> the capital expenditure authorised, even configuring the new boxes the same as the existing ones, all introduce unnecessary delay. It's a constant game of cat and mouse between demand and capacity.

With cloud hosting, you don't need to worry about any of that. A new server can be powered up in a matter of minutes and configured exactly the same as your existing one using a simple configuration tool. Similarly, if your demand falls off, you can turn these extra boxes off as easily as you turned them on.

Cloud computing takes the infrastructure and scaling costs out of professional hosting. As such, the ground is fertile for new web ideas that previously just wouldn't have been possible. Just like open source software, cloud hosting reduces the cost of failure.

Everything as a service

With storage, backups, music and even operating systems such as GOs (thinkgos.com) being run as a service, personal computers will become smaller, lower spec and ultimately cheaper. There's less for them to do, as everything is done on the cloud. This phenomenon is known as thin-client computing – we'll able to run all of the apps we currently run on our laptops and PCs on the cloud. Gartner has predicted that worldwide netbook sales will grow from just over 5million in 2008 to 7.8million in 2009. That's more than 50 per cent growth, compared to a predicted 15 per cent growth for the entire laptop market and an overall decline in sales for desktop PCs.

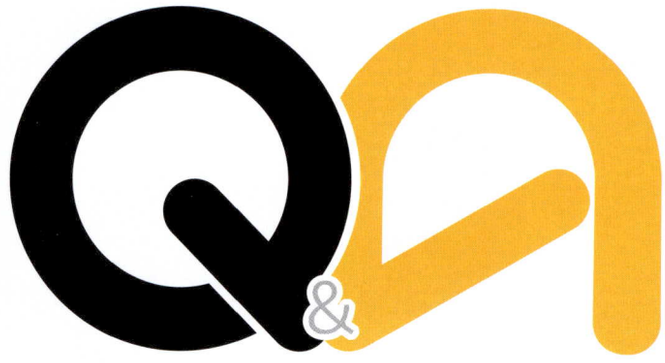
Music need no longer take up bags of valuable space on your hard drive. Ownership is old hat. Run your digital life as a service. There's just no escaping the cloud! ●

WWW. *Do you trust the cloud with your data? Share your views at forum.netmag.co.uk*

Mail role model You may not realise it, but if you've got a GMail account, you're already using cloud computing

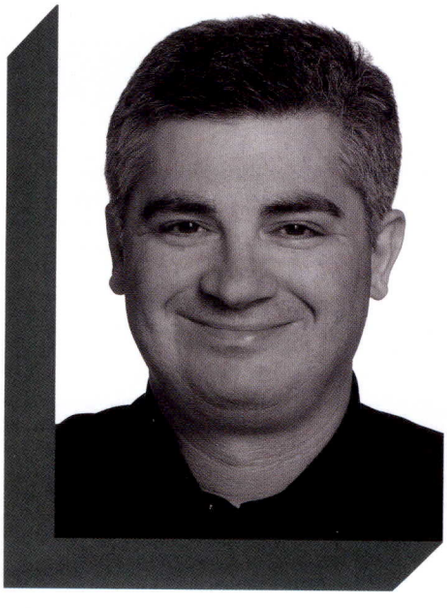
The ecosystem

Although most of us are used to hosting apps on servers, most of us aren't used to hosting apps on servers that shrink and grow as the application is used. Tools like Scalr (https://scalr.net) and Right Scale (www.rightscale.com) will scale your EC2 cloud up and down based on server loads, times of the day and other factors. With tools like this, you can concentrate on building apps rather than server maintenance. If you want to be joined to the cloud all the time, then ElasticPod gives you control via your iPhone. The 'ecosystem' is quickly filling up with products to manage servers, backup, scaling and more. In the same way you previously hired someone to look after your dedicated box, you can find a growing number of companies able to get your site running – and scaling – on EC2.



Jeff Barr aws.amazon.com

Amazon Web Services consume more bandwidth than all of Amazon's global sites combined. Jeff Barr explains who's using them and why they've become so popular with businesses of all sizes



Jeff Barr

Job Senior manager, cloud computing solutions at Amazon.com

Age 47

Education BS in computer science from the American University; graduate studies at the George Washington University

Web career Jeff operated his own consulting practice and also spent some time at Microsoft, where he worked on Visual Basic and .NET

Sites jeff-barr.com, aws.typepad.com

.net: Why did Amazon decide to open up its web services in the first place?

JB: We spent over a decade building one of the world's most reliable, scalable and cost-efficient web infrastructures. In that time we learned a great deal about how to both develop these services and run them. Amazon Web Services gives any software developer the keys to Amazon's back-end infrastructure, which they can use to build and grow a business. This makes it possible for any company to reach the scale of major internet players such as Amazon.com, but without the expensive price tag.

.net: Who are they aimed at?

JB: When we started this business we imagined that smaller companies, particularly start-ups, would be the first to take advantage of our services. Now that our services have become more mature, we're seeing larger companies take advantage of them as well. We thought that transition would take a couple of years, but we're seeing that it's happening a lot more quickly than we expected. It's clear that even large companies don't like dealing with the muck, so we're happy to do it for them.

.net: What kind of technical knowledge do you need to use Amazon Web Services?

JB: These services are built for developers, so one needs to have some level of coding ability to use them. A number of powerful load management tools, high-level programming libraries and complete programming systems have also been built by members of our developer community.

.net: How many people are using Amazon Web Services, and who are they?

JB: We have over 370,000 registered developers ranging from start-ups like Ooyala and Animoto to large companies like The New York Times Company, NASDAQ and SanDisk to partners such as Red Hat and Sun Microsystems. Companies of all sizes can benefit from the reliability, scalability and low cost of Amazon Web Services.

.net: At the beginning of 2008, the S3 storage service was hit by a major outage. Then in April it hit the EC2 cloud computing service. Why?

JB: In regards to S3, in one of our locations we started seeing elevated levels of authenticated requests from multiple users. This pushed the authentication service over its maximum capacity before we could finish putting new capacity in place. As well as processing authentication requests, the authentication service also performs account validation on every request Amazon S3 handles. This caused Amazon S3 to be unable to process any requests in that location. We took immediate action, improving our monitoring of the proportion of authenticated requests, further increasing our authentication service capacity and adding additional defensive measures around the authenticated calls.

In regards to EC2, we began a maintenance change with one of our redundant internet access points. Under normal circumstances, our network routing protocols automatically shift traffic away from these internet access points until a change is completed. In this case, a latent, incorrect configuration caused affected instances to route outbound traffic to the degraded internet access point. As a result, the outbound traffic routed via this access point was not successfully forwarded to the internet. Our monitoring correctly detected the initial loss of connectivity and the engineering teams were fully engaged within minutes.

As with any operational issue, our internal post mortem process helped us identify ways to prevent this sort of issue in the future and reduce our recovery time when the unexpected does happen.

.net: How do you see cloud computing developing in the future?

JB: Over the past two years, the Amazon Web Services platform has become increasingly robust and customer-friendly as we've listened to our developers about the services they're using and innovated on their behalf. We've added numerous features to our services as a result of this ongoing feedback loop. We're pleased by the number of businesses who are using the services.

.net: What's your vision for Amazon Web Services?

JB: What AWS is doing is offering web scale computing services that free software developers and businesses from the burdens of launching and growing a successful web business.

> "Any company can reach the scale of major internet players, without the price tag" Jeff Barr

Jonathan Brealey on...

Design, build and host!

Web designers are missing out on extra revenue by not offering hosting as part of their services, according to Heart Internet's **Jonathan Brealey**

How often have you been asked by a client to recommend a company for hosting their website and have ended up pointing them in the direction of your own web host? As a web designer or developer, you have a client base that needs web hosting and domain names for the sites you're creating. Offering these things should be a natural extension to any web designer/developer's service portfolio.

Clients often don't have enough knowledge of the hosting market to find a web host easily, so they'll happily buy hosting from someone who can handle all aspects of their site. From the perspective of you, the designer, this can become a healthy source of recurring revenue, as well as a way to maintain customer contact once the initial design work is complete.

Becoming a web host

One option designers take is to host their clients' sites from their own website's Virtual Private Server (VPS) or dedicated server. Killing two birds with one stone can make financial sense at first; however, hosting multiple clients' websites this way can soon become an administrative nightmare. Web hosting is more than just allocating web space to store and access the site's HTML, CSS, PHP and JavaScript files. A specialist reseller solution provides you with an environment built specifically for the set-up and management of clients' hosting accounts, creating tiered hosting plans, automating emails and managing billing.

> "Offering hosting is a way to maintain customer contact once design work is complete" Jonathan Brealey

A search on Google for 'reseller hosting' shows there are plenty of suppliers to choose from. The best reseller packages are offered as completely white label (also known as private label) and should enable you to tailor every component to your own requirements so that the client need never know their website is hosted with anyone else. Other main features I recommend looking for include whether the host has any limitations on the amount of web space, traffic, emails and databases you can resell. Do they offer both Linux and Windows accounts and which programs do they provide for you to offer your clients (eg one-click install WordPress)? When it comes to deciding whether to use a host in the UK or the USA, my main consideration would be whether or not you will be able to get access to free support during UK business hours.

How much you charge should be based on your initial investment, your customer base's price sensitivity and any local rivals' pricing structure. It's also worth considering offering a discounted rate for customers who pay for a full year in advance. Once you're up and running, a good place to start to build your hosting customer base is with clients you've already worked for. If they were happy with your work, let them know what you can provide and offer an incentive to move over (maybe offer to do the transfer for them).

Supporting your customers

Unfortunately, hosting isn't a 'fire and forget' product. From the start, you need to be clear about the level of support you can offer to your clients. If you've set up a completely white label solution, your clients will come to you directly and you should expect to have to put aside time for this. Support issues that may arise could be as simple as clients forgetting their email log-in details, which can be dealt with quickly, through to a site's database crashing and taking everything else down with it. A problem like this will be fixed by the reseller host, but you'll essentially need to liaise between your client and your reseller host.

Lasting relationships

Reselling web hosting puts you at the centre of each stage in the process, from concept to execution to launch, and helps you develop long lasting relationships with your clients. Even if you decide to offer the hosting on a cost basis, the long term benefits (such as being the likely first port of call for future design work) make it a worthwhile investment. ●

Jonathan Brealey is one of the founders of Heart internet (www.heartinternet.co.uk) supporting consumers, SMEs and web designers with domain names, hosting and reseller services.

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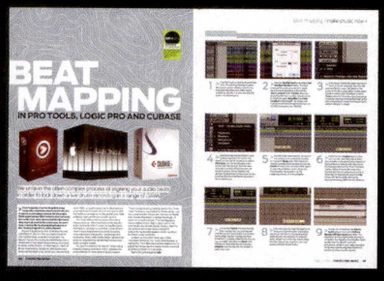

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Hosting

Choosing the right provider has never been more difficult. **Karl Hodge** asks whether bundled packages offer value and investigates cloud-based hosting services

Web domain and hosting bundles

Most hosting providers offer domain name registration as part of their service. Some sweeten deals by offering it 'free'. It's a tempting prospect. There's no faffing around with DNS settings, no need to configure mail and web domains. You just let your host do the donkey work while you get on with what you're good at; making websites.

Problem is, if your service isn't up to scratch, untangling the mess is that much harder. "A large chunk of our man-hours are taken up with new clients who, for one reason or another, have lost control of their domain name," says Adam Smith, technical director at UK Webhosting Ltd. "Maybe their previous registrar has gone out of business or intends to charge an extortionate 'release fee'."

The solution, Smith says, is to separate domain registration and hosting: "If you intend to host with a lesser known hosting provider, register your domain name with an established, reputable and impartial third party such as www.123-reg.co.uk."

Not everyone in the industry agrees. Karl Austin, director of KDA Web Services Ltd, says problems are worst at the budget end of the market – and separating domain and hosting has its own issues. "We've had customers call us asking why their site is down and it's been due to DNS issues with their domain provider," Karl told us, "If you're looking for a seamless service, put domains with your host – you then have one point of contact."

Karl's advice comes with a disclaimer, though: "Do your research. Ask the company whose name the domain will be registered in and make sure they have an online system for managing it. Also, pay by credit card. You have more protection and recourse for claiming money if things go wrong."

Karl Hodge's recommended...

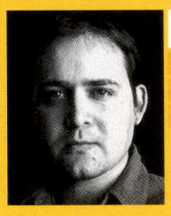
Arbitrators

Name Otelo
URL www.otelo.org.uk
Info OFCOM offshoot Otelo acts as a neutral dispute resolution service when you have issues with your telecoms provider – including your ISP.

Name CISAS
URL www.cisas.org.uk
Info If your ISP isn't covered by Otelo, then check if they're with CISAS. Find the 'Make a Complaint' link on the Customer Information page, if you can.

Name ISPA
URL www.ispa.org.uk
Info A voluntary regulator that seems to get the best results for complainants. If your ISP is with them, they'll intervene when your provider's usual complaints procedure doesn't do the trick.

Watchdog Karl Hodge investigates underperforming broadband speeds



Expert advice

Name Karl Hodge
Job title IT journalist
URL www.spodgod.com

Paul Robertson's switched from cable to ADSL following a house move. He went on to experience connection speeds under 1Mbps and frequent dropped connections. He traced the problem to his distance from the local exchange. Twelve months on, finding it impossible to connect at peak times, his connection ground to a halt. Paul decided to take drastic action and has since ditched his ADSL connection.

BT says 99 per cent of the UK has access to broadband services, with 60 per cent connecting via ADSL. Though several ISPs now offer 24Mbps services using ADSL technology, up to 8Mbps remains the standard. Yet the average speed experienced by users is actually 3.6Mbps – less than half the headline speed. According to Ofcom, 20 per cent of users squeeze less than 2Mbps from their 'up to 8Mbps' connections. This severely undermines BT's claims to '99 per cent coverage'.

A fifth of users are in broadband blackspots, with services compromised by old copper cabling and distances to exchanges. BT will troubleshoot your connection if your download speeds are slow. The BT Accelerator service includes a line check and visit from a BT engineer. If they can't boost your connection by 0.5Mbps, there's nothing to pay. That's the good news. The bad news is it costs £88.09 if it's successful.

Which brings us back to Paul Robertson. So sick of slow broadband was he that he dumped his ADSL altogether. Now he's using a Three Mobile (www.three.co.uk) broadband dongle to connect to the net. The cost is £10 a month and he gets consistent speeds of around 3.6Mbps. The paltry download allowance of 1GB a month is no good for downloads, but fine for casual browsing and email. With a boost to 7.2Mbps coming soon – a speed already offered by Vodafone (www.vodafone.co.uk) – mobile broadband is fast becoming viable for folks who are caught in ADSL blackspots.

Watchdog
If you have a complaint about your ISP or web host, use the subject line "Watchdog" and email us at netmag@futurenet.com

The secret to scalable hosting

Recently, we invited some smaller hosting companies to get in touch with product news. Tsohost (www.tsohost.co.uk) told us about a scalable hosting package aimed at "all users", including homes and small businesses.

"Cloud computing and grid hosting have been popular buzzwords for the last 12 months," says Darren Lingham at UK Webhosting Ltd. "It refers to computing capacity residing within a 'cloud' of servers, scaling their requirements with demand."

Darren identifies two problems with the standard cloud hosting model. One is accessibility, another is cost. Rackspace's Mosso platform is easier to configure than others, but still costs $100 a month.

Tsohost has a more economical clustered hosting product with "automatic load balancing" at an affordable £9.99 a month.

In theory, your site should shrug off traffic spikes, because demand for data is shared among a grid of connected machines.

We asked our panel of experts to evaluate the effectiveness of this approach. "This still has all the usual issues of a shared hosting platform, with other users potentially consuming your resources," says Sam Bashton of Bashton Ltd (www.bashton.com). Karl Austin, owner of KDA Web Services (www.kdawebservices.com) wonders if corners are being cut. "Customers should get increased levels of reliability and a level of scalability," he says, "but with such heavy overselling in the pricing, it's hard to judge just how much, as developing a robust system does not come cheap."

Of course, the real proof of the product is in using it – we're happy to support smaller companies trying innovative solutions.

Karl Hodge's recommended... Scalable hosting

Name Tsohost
URL www.tsohost.co.uk
Info Tsohost offers a load balanced service for £9.99 a month. Ideal for small businesses, this scales to demand and is easy to administrate.

Name Mosso
URL www.mosso.com
Info Rackspace provides a more heavyweight solution offering "unlimited sites, database and email". Prices start at $100 per month, with an easy to use control panel simplifying administration.

Name Amazon EC2
URL aws.amazon.com/ec2
Info For larger ecommerce site using Amazon Web Services, this highly customisable server environment is paid for by the hour.

Watchdog Karl Hodge explains how to get the service you pay for

Peter Shorley-Harlow wrote to tell us that, after several years of decent service, his AOL line speeds were slowing down. Contacting the customer services department didn't lead to any solution, with tech support blaming the distance from the exchange and line quality for the slow service. So, what can you do when your ISP won't escalate your issue and your service suffers?

We say: vote with your feet...

Before you decide to switch internet service providers, make sure your speeds really are as slow as they seem.

Give the connection speed test at www.dslzoneuk.net a go. We've found this to be far and away the most reliable UK speed tester online. You have to register, but it's free and stores a history of tests enabling you to clearly discern a pattern in service if there is one. There's also some great advice on improving your line speeds.

Mr Shorley-Harlow had a 2Mb package with AOL. These days, several providers offer similarly priced "up to" 8Mb packages.

As BT had measured the capability of his line at 3Mb, an upgrade to an 8Mb package wouldn't unleash lightning speeds, but it would improve service overall. 8Mb services use different technology to the old 2Mb service. As long as you haven't recently – and explicitly – renewed your contract with your ISP (by accepting new equipment, or an offer on your account, for example) – you should be able to switch providers by getting a MAC (Migration Authorisation Code) from AOL and providing that to your new ISP. They should do the rest for you.

In Mr Shorley-Harlow's case, that's exactly what he did. And, when he did, AOL escalated his case, offering him a free 8Mb upgrade and new router. An engineer troubleshooted his connection and, for a couple of weeks, everything was swell.

However, the speed increase didn't last and once again, Mr Shorley-Harlow was back on the phone asking for his MAC code.

Now he's moving lock, stock and barrel – after seven years with AOL – over to BT.

Switching service providers should be a last resort. But at the end of the day, if you pay for a service; you deserve to get it.

Karl Hodge is a print journalist with 15 years in the techno-trenches

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.net

Secure your site

The need to provide a website that's trusted and secure is accepted unquestioningly by organisations, but how should it be achieved? **Patrick van Kann** addresses the issues

Words **Patrick van Kann**
Patrick is director of technology at Fortune Cookie in London
www.fortunecookie.co.uk

Image **Knight Design Studio**
Bristol-based graphic design agency.

Website security is a complex topic that cuts across multiple disciplines and requires a sophisticated, strategic approach with inputs from all levels, and not just from technologists.

A flawed approach to web security can result in immediate and direct financial impacts due to theft, compensation payments or legal action. Other losses are indirect and hard to quantify. Overlooking security will result in a lack of trust from customers and partners who will be less willing to entrust data or conduct transactions with you. But where do you start? It's important to calculate what's at stake before beginning to consider the range of techniques available to you.

Before delving into the mechanics of defending your site, consider who you're defending it against

Know your enemy

Before delving into the mechanics of defending your website from online attackers, it's worth considering who you're defending it against. While there's an undeniable risk of outsiders (so-called "hackers") compromising your site or stealing your data, a more pressing security issue could be from within: your employees or colleagues, either through error or through deliberate acts of sabotage.

Many companies invest in external firewalls, yet leave their servers completely exposed to PCs on the intranet. Frequently, employees such as web developers may know passwords to these production webservers and databases. Such a temptation could turn a moderately disgruntled employee into a major security risk. Even when not motivated to steal data for themselves, an employee could be motivated to steal >>

SPAM
SQL INJECTION ATTACK
ESCAPE SEQUENCES
CERTIFICATES
HACKERS
SPAM
STRATEGIC APPROACH
FAKED FORM POSTS
ENCRYPTION
DEFENDING YOUR WEBSITE
PASSWORDS
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PRECAUTION
KNOW YOUR ENEMY
THEFT
R18
J2
Q7
R23
C24
R17
CR2
Q5
SECURE YOUR NETWORK
HACKERS

Utilise paranoia for the good of security

Pip Thorne – Technophobia

"Think of the data!" Why is this field in my form, how do I ensure the data is valid, and what will I do with the data when I get it?

The easiest way to keep your user's data safe is for them not to give it to your website. But if the information is vital, how will it be stored to ensure that no one else can get at it? What measures will you take to make sure that the person at the other end of the network connection is who you think they are before showing them any data?

The more exciting, shiny things you include in your page, the more opportunities there are for someone to find and exploit vulnerabilities. This applies if you write the code yourself (the bigger the code base, the more testing it requires), and moreover if you use third party libraries. If you don't have time to write all the code, do you have time to check that it's all up to scratch? Live exploits on the internet often search for giveaway strings and file names in sites to identify sites that they can crack open with tools they already have.

Be paranoid

Trust no one. No component of your system can be guaranteed faultless, so keep in mind at all times the possibility that there could be faults in your server technology, programming language, database, etc. Maintaining a healthy paranoia at all times will set you in good stead and could help you avoid disaster.

Use a hashing algorithm to protect sensitive data, but pick your algorithm carefully, as many are easily cracked.

Never trust a browser. Any data received from a browser can be manipulated by a hacker. For example, don't assume that a **UserAgent** string won't include JavaScript just because it's set by the browser. It can be overridden by any half-competent hacker.

When validating form inputs (or any other data received from the browser), never simply filter out known attack data. Instead, only ever allow inputs that are exactly as you expect them to be. Your code will be more likely to be protected against new attacks that are known about yet.

Put validation in at every level of your code, JavaScript, server-side scripts, database interface, and page creation.

If there's one thing that helped me understand the subtleties of web security, it was understanding cross-site scripting (XSS). This is best understood by imagining the following scenario: An online banking website has a cross-site scripting vulnerability that allows JavaScript provided in the query string to be put into the page itself. Henry, a hacker, sends an email to Brian, an online banking user, asking him to log in to his bank account by clicking on the link in an email. Brian naively obliges.

The link that Henry sent included a piece of JavaScript that sent Brian's session cookie to Henry (via Henry's specially modified webserver). Henry's server now has Brian's logged-in identity, so he automatically transfers all of Brian's money into an account in Nigeria.

Obviously, this is a very simple scenario that all online banking providers protect against. However, the principles could be applied to any website that holds personal information about its customers.

>> data for an external criminal influence. Finally, an employee losing a laptop or memory stick containing data or passwords by accident could result in a major breach.

Nevertheless, the identikit hacker (lonely, alienated computer genius out to wreak havoc on unprotected servers) is a real presence on the internet. Skilled hackers are massively outnumbered by less sophisticated, yet still dangerous, "script kiddies" – relatively unskilled programmers (often young) who use prepared scripts to search out and exploit vulnerable computers. An increasing threat is posed by "zombie" PCs – computers that, once compromised, seek out other vulnerable computers to similarly infect.

Secure your infrastructure

A secure website requires a secure supporting infrastructure. This means that all network infrastructure, firewalls, operating systems, web application servers and databases must be secured against attack. Vulnerability in any one of these systems could compromise the entire site.

Secure your network

The most basic and effective measures to prevent security breaches can be taken at the network level by implementing a firewall with an effective rule base.

The first step is to disable all network protocols except for those required to serve your website, which should only require TCP/IP. Only expose those servers that actually need to be seen from the internet. If you have separate web and database servers, only the webserver should be mapped through the firewall. This means that a Network Address Translation (NAT) rule need only be created for the webserver, which will give it an

Skilled hackers are outnumbered by less sophisticated, yet dangerous, "script kiddies"

Resources Security standards

Centre for Internet Security
The Center for Internet Security (CIS) is a non-profit enterprise whose mission is to help organisations reduce the risk of business and ecommerce disruptions resulting from inadequate technical security controls. An essential security resource.
www.cisecurity.org

The Cult of the Dead Cow (cDc)
The cDc is a famous/notorious computer hacker and media organisation founded in 1984. It created many well-known tools for hackers as well as system administrators. Links to other sites are available, including Ninja Strike Force.
www.cultdeadcow.com

Hacktivismo
This is an offshoot of Cult of the Dead Cow, whose beliefs include access to information as a basic human right. Oxblood Ruffin, the director, has argued against definitions of hacktivism that include web defacements or Denial of Service attacks.
www.hacktivismo.com

About cross-site scripting (XSS)
A solid explanation of the various types of cross-site scripting attacks and how they can be avoided can be found at the Wikipedia site. There are plenty of other useful links at the foot of the page for further reading.
en.wikipedia.org/wiki/Cross-site_scripting

Expert tips Mog, Mike Cherin and Dave Barter

Always be on high alert for the potential of SQL injection. Never put raw user input into SQL strings ...ever.
(Mog, www.mogmachine.com)

Complacency is the enemy of most security policies. You should continuously review the operation of your application and its environment and look to improve areas that you consider weak.
(Dave Barter, www.legatio.com)

Never open your domain's file structure to the public. Keep it locked down. If you don't know how, learn. Experimentation is unforgiven in this case. Files with public access permissions are vulnerable, but they don't have to be. Ownership can be passed to the application that requires access, at which point access can be removed to all other parties.
(Mike Cherim, GreenBeast.com)

Don't trust any input. Many applications are compromised by hackers, including unexpected data within form submissions or data uploads. You should always assume the worst with any input to your programs, no matter where it comes from. Check it to make sure it conforms to the format you're expecting (eg phone numbers are numeric) and discard it immediately if it doesn't.
(Dave Barter, www.legatio.com)

Always verify and filter user input. Always. Forms, search ... it doesn't matter. Filter it all.
(Mike Cherim, GreenBeast.com)

Never display user input without escaping it, particularly on blogs, message boards and comments.
(Mog, www.mogmachine.com)

Reduce privileges. Your application should only be allowed to access the data and resources it needs in order to operate.
(Dave Barter, www.legatio.com)

A lot of information can be gleaned from monitoring your domain's logs: error logs, access logs, referrers and accessed files. All of these can reveal security exploits that are being implemented. It's a good idea to look at your physical file structure to look for anomalies such as files you don't recognise, such as files that show updated dates later than when you last updated them.
(Mike Cherim, GreenBeast.com)

Learn to validate your domain to include accessibility evaluation. If you have a quality site and suddenly find errors and problems, it could be because something was added to your pages that you didn't put there yourself. Miscreants are notoriously sloppy and not web standards-minded, and this can lead to the exposure of their handiwork.
(Mike Cherim, GreenBeast.com)

Trap and report errors. It's all too easy to assume that your program will work as expected. However, many of the most serious security flaws have occurred from poorly handled exceptions in code. You should continuously review your code to ensure that all errors are properly trapped and handled.
(Dave Barter, www.legatio.com)

Develop a proper test plan for your application and see it through. Consider using a third party penetration testing service to give your application and environment a real work-over prior to going live.
(Dave Barter, www.legatio.com)

Interview

Sean Gardiner
Precedent Communications

It's hard not to be paranoid about website security when horror stories of how people's lives can be destroyed feature in the news on a daily basis. I believe the biggest issues with website security are the exploitation of a site's code and weak password protection.

Exploitation of site code

Most websites and web applications are primarily developed to help people perform a function such as buy something online or to manage a website. Unfortunately, one of the last things considered during the development of a new system is how a hacker might misuse the system to their advantage. Avoiding exploitation of code is, in most cases, quite simple. Often, hackers will try to either gain access to a database or will misuse the emailing facility of a website. Protection from such attacks are well-documented. Hackers will always trying something new, so a regular security review of your website is strongly advised.

Weak password protection

The easiest way to create havoc on a website is by accessing the control panel of a system. The first thing a hacker will need to do is either guess or simply ask for the password. Although it sounds unlikely, some systems have been bypassed by the hacker simply ringing the support department and asking for the password! Additional precautions can be taken, such as only allowing certain IP addresses to access a system.

external IP address and will enable clients on the internet to connect to it.

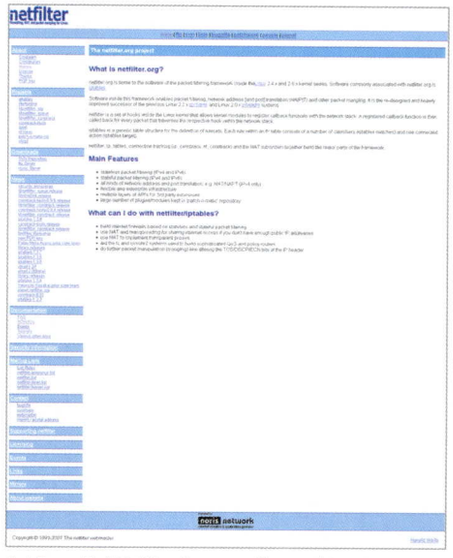
For the servers that are "NAT"-ed, you should only enable the TCP/IP ports that are needed. This means port 80 (the default port for webservers) and 443 if you use transport layer security/secure socket layer connections and a digital certificate for your website.

All other ports should be disabled. If your web developers are in the habit of using FTP to manage the site, consider disabling FTP access and instead create a virtual private network (VPN). FTP is a poorly designed protocol and is often the source of exploits. Given that most commercial firewalls (and indeed open source examples such as FreeSwan) will enable VPN connections, it's definitely worth considering this option. Once set up, developers will be able to securely and remotely access the server as if it were a local machine. This will be a vast improvement from all perspectives!

If you can't create a VPN and must enable remote access, you should at the very least use SSH FTP (en.wikipedia.org/wiki/SSH_file_transfer_protocol) in favour of plain FTP, as it's comparatively less vulnerable. Likewise, proscribe the use of Telnet in favour of SSH, as this encrypts traffic between client and server.

Additional network security can be achieved in a multi-server environment using a "reverse proxy" server. A reverse proxy handles all web requests and transparently forwards them to the actual server that services the request. This means that the web client only ever deals with the proxy and has no knowledge about the architecture of your web and applications servers, making it more difficult to exploit a vulnerability that may exist in these systems. This approach has other benefits, as it can allow websites served by multiple servers and multiple technologies to appear to be served from a single domain without the need for additional subdomains. Microsoft ISA Server and Apache can both be configured to act as a reverse proxy.

Finally, consider implementing an intrusion detection system such as Snort www.snort.org). Snort goes beyond what most basic >>



Get firewalled Netfilter (www.netfilter.org) is a Linux firewall built for Linux 2.4 and 2.6 kernels

Avoiding issues Peter Hammans – Precedent Communications

Every developer knows that site security is important, but few invest the time in ensuring it. It's amazing how many times business clients don't even mention the word "security" in the project life-cycle. As a developer, I come across recurring security issues. Although the issues are serious, they're surprisingly simple to avoid.

Encryption of form data and HTTPS requests

About half of the online payment systems I've encountered don't use SSL and HTTPS to ensure that form data is encrypted. This means personal data, passwords and credit card information, for example, are submitted in plain text! Of course, this makes it much easier for hackers to view and collect your personal information.

SQL injection

SQL queries very often take user-specified data to manipulate or retrieve information in a database table. Typically, this is through a form (or series of forms) – anything from a simple enquiry form through to multi-tiered web applications. A hacker can modify table information beyond the intended query scope simply by specifying additional user input parameters. This is probably one of the most common and direct ways a hacker can interact with a site, and is also one of the most basic security issues to address.

Password security and personalisation

Few companies seem to enforce password policies that would help site users keep their own accounts secure. The failure to help site users "be secure" can contribute to the general insecurity of a site.

Expert tips Confounding the spambots

A problem that faces many sites is the dreaded spam – specifically, spam "bots" that crawl through websites and harvest email addresses or abuse community facilities such as message boards to post.

Unfortunately, avoiding email harvesters is something of an arms race. Any step you take to encode the email address will eventually be figured out by the spambot writers. Techniques to insert email addresses dynamically using JavaScript or Ajax seem to currently work as spam bots don't execute JavaScript (yet).

```
<script type="text/javascript">
var user = "user";
var domain = "domain.com";
document.write(email + "@" + domain);
</script>
```

This would write: user@domain.com. Alternatively, you could use a CSS technique:

```
.email:user { content: "user@"; }
.email:domain { content: "domain.com"; }
```

This could be inserted into a HTML page like this:

```
<span class="email"></span>
```

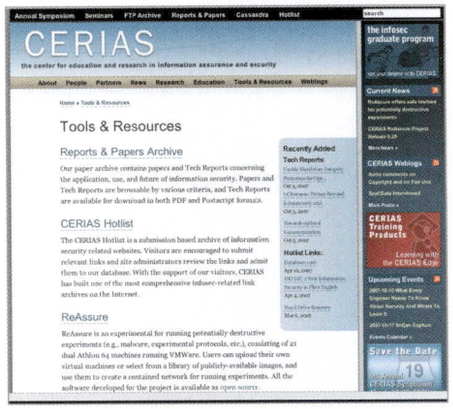
This would have the same result as above.

Inevitably, whatever technique you use will eventually be discovered and circumvented by the spambot writers if it gains currency among web developers.

The JavaScript techniques suffer from another disadvantage: they won't work for users with JavaScript disabled or those who are behind corporate firewalls that disallow JavaScript. This violates a basic principle of web accessibility.

Preventing bots or even persistent users from abusing your forum and posting spam can also be difficult. A common technique is to use CAPTCHA images. These are images that have been distorted in such a way that makes them particularly difficult to read by machines.

A human user can still read these and register and post on your forum, but they're effective against bots. However, they also pose an accessibility problem. Users with impaired vision will be unable to read the image and post legitimately on your forum. The simplest technique is to require the user to register with a genuine email address and not enable posting until the user has received a confirmation email at this address and has responded to it. Many forum packages will support these and potentially other security measures. Further information about techniques for foiling spambots can be found at tinyurl.com/2oo822.



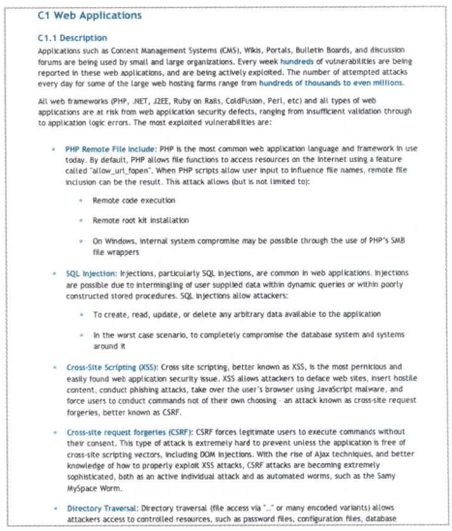
CERIAS The Center for Education and Research in Information Assurance and Security is a site you shouldn't ignore (www.cerias.purdue.edu/tools_and_resources)

>> firewalls are capable of and delves deep into web traffic to perform protocol analysis, content searching/matching, and can be used to detect a variety of attacks and probes, such as buffer overflows, stealth port scans, CGI attacks, SMB probes, OS fingerprinting attempts, and much more. Snort is, in some ways, similar to an antivirus system in that it has a rule base that's continuously updated to include defences against new exploits and vulnerabilities. And Snort is an open source product, so it's free to download and install on Linux servers. (See Resources on page 199.)

Stay up to date

While opinions diverge on the relative merits of Windows and Linux operating systems with respect to security, it's fair to say that the latest versions of Windows and the various flavours of Linux are vastly improved over previous versions. It's also true that both suffer from security vulnerabilities, but Windows vulnerabilities are often well-publicised, as they affect a broader population of users.

However, whatever operating system your site is built upon, the most critical security precaution is to stay up to date with the latest security patches. This is generally a simple task – Microsoft provides



SANS security Stay up to date and informed with the help of the Top 20 according to SANS (www.sans.org/top20/#c1)

Interview Dave Barter shares his practical experience of creating secure websites

Name Dave Barter
Job title Director/founder
Company Legatio Technologies
Url www.legatio.com

As a novice developer, it can be tempting to spend hours looking for the special elixir that would make all web applications magically secure. Instead, you find yourself tinkering with a variety of security products and software solutions in the blind hope that they will somehow secure your application.

Trying to secure a website without any real method or structure is counterproductive, because you lose valuable time in a maelstrom of investigations, installs and patches. A website running poorly installed or maintained security products can be just as insecure as a website without.

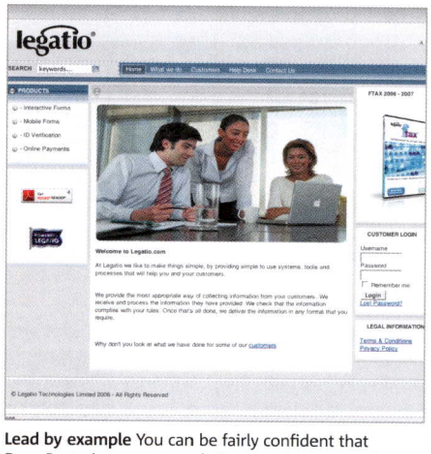
When securing a website, there's simply no substitute for experience. However, even if you're a novice when it comes to security, a few simple principles can help you reduce the risk of being hacked.

A large number of secure applications have been hacked because of insecurities that exist within the environment they're installed upon. Before you publish an application to the internet, you must have confidence with the environment within which it will run.

Often, this is out of your control, provided by an ISP or the IT department. So, ask the provider a few questions:

- How is access to this environment controlled?
- Is it running up to date software (webservers, databases, etc.)?
- Is there a proper process to update components as security issues arise?
- Is my application shielded from others?
- Is there a security policy, back-up plan and disaster recovery plan?

These questions are equally applicable if you're providing the environment yourself. You need confidence in your webserver environment before you upload a single line of HTML to it.



Lead by example You can be fairly confident that Dave Barter's company website, Legatio, is secure!

Microsoft Update, which can be run to download and install patches very easily. Linux distributions offer similar tools, such as APT (Advanced Package Tool) on Debian.

Use it or lose it

Another simple and effective precaution is to disable all server services that aren't needed. This is the default case in Windows 2003 and Linux, but older versions of Windows are likely to be running services by default that aren't needed. "Hardening" scripts are available that can be run to disable unneeded services, and these will probe your server's services and prompt you to switch off what isn't required.

Protect your database

Securing your website is pointless if a hacker can exploit your database to obtain your data directly. The first recommendation is don't NAT the database through your firewall; if it has no external IP address, it makes it much harder to attack from outside the firewall.

Although this may annoy developers, disallow database administration tools through the firewall. As recommended earlier, set up a VPN if your developers must access databases remotely for management. As a corollary to this, don't use web administration interfaces such as phpMyAdmin. Exploits in tools such as this will be rapidly disseminated through the hacker community, and if you're using it, you expose your database to potential compromise.

Web/application servers

Your webserver itself could be a source of vulnerability if not carefully administered and configured. As with your operating system, the first step is to switch off or uninstall features that aren't needed. Many application servers ship with test or demonstration applications. These should be removed.

Scripted attacks or human-originated attacks will be directed at particular webservers or operating systems

As with web administration consoles for databases, if your web application server ships with a web-based configuration tool, make sure you disable it, or at least ensure that the default passwords have been replaced with much stronger passwords. Frequently, scripted attacks or even human-originated attacks will be directed at particular webservers or operating systems. These will check the HTTP headers of pages served by the application to see if the server has included information that indicates what type of server it is. For example, IIS 6.0 sends the following script in the HTTP headers by default:

>>

Resources Tools and utilities

Snort
According to its creators, "Snort is an open source network intrusion prevention system capable of performing real-time traffic analysis and packet logging on IP networks. It can perform protocol analysis, content searching, and can detect a variety of attacks and probes."
www.snort.org

Netfilter Firewall
Netfilter is a packet-filtering framework inside the Linux 2.4.x and 2.6.x kernel series. It can be used to implement a firewall using just a standard commodity server with Linux and Netfilter installed. It started around 1999/2000, and the first development workshop was 2001.
www.netfilter.org

Apache HTTPD Server
Apache can be used as a reverse proxy ("a gateway for servers that enables one web server to provide content from another transparently"), which is useful for obscuring the topography of your actual webservers and application servers.
httpd.apache.org/docs/1.3/mod/mod_proxy.html

Bastille Linux Hardening Tool
This hardening tool supports such Linux distributions as the Debian, Red Hat, Gentoo, Mandrake, SuSE and Fedora Core, and it can also be used for such operating systems as HP-UX and full Mac OS X. This is what we call versatile!
www.bastille-linux.org

Plugging security holes

Tim Clark – Precedent Communications

Exploits

Site security is a moving target. New exploits are found on a daily basis and it can be a full-time job keeping up with them. Fortunately, there are a number of sites that can keep you ahead of the game, including these two:

Securiteam
www.securiteam.com
BugTraq
seclists.org/bugtraq

Security scanners

New security holes are discovered all the time. Ensuring your webservers aren't vulnerable can be time-consuming. A security scanner will attempt a whole armoury of exploits on your system and tell you where you're vulnerable. Our favourite Security scanner is Nessus (www.nessus.org), which is free (though not GPL any more). It presents a nice interface and can scan your network to check for new vulnerabilities.

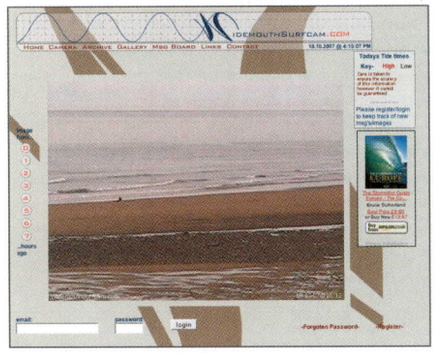
Don't always trust standard installation options

When installing web services such as FTP or SMTP, always check the settings before turning the service on, as not doing so can be disastrous. For example, the FTP server that comes installed with IIS6 has anonymous access enabled by default, which means anyone can upload to your newly configured server.

Google as a hacking tool, redirects and robots

We recently got a new IP webcam in the office. It has a web address that enables the camera to be remotely controlled. As an experiment, we copied the scripting part of the URL into Google.

The results were surprising. We could remotely control webcams in garages in America, beaches in Cornwall and many offices all around the world because people hadn't secured them. As a rule, we want search engines to hit our websites. However, if you're using a standard CMS, and an exploit has just been released for it, you could be advertising your vulnerability to the world via Google. The solution is to set up proper security and to add a 'robots.txt' file to any scripting directory. This will stop Google in its tracks.



Are you being watched? With a simple script, you could control the webcam watching the surfers in Cornwall

Interview

Dave Cobb
RNIB

When it comes to trusting user input, never assume. Users can forcibly gain access to your system with the potential to cause malicious damage. SQL injection attacks are a common example of this. Use client-side and server-side validation. Client-side validation using JavaScript may seem overkill in addition to server-side validation, but it increases the usability of the site and reduces the amount of return calls to the server. However, never rely on client-side validation alone, as this can be switched off in the client's browser.

When validating form data, ensure that it's received as intended. If you expect only alphabetical characters in a field, validate for alphabetical characters (this may seem like common sense, but is often overlooked). Regular expressions are a great help here, as they can be used to check for different patterns of user input.

Try not to use hidden fields for sensitive information, and don't expose business logic, as this could be easily hacked!

Gain an understanding of how your web apps can be hacked. This will help you understand how to build secure solutions. *How to Break Web Software* by Mike Andrews and James A Whittaker is an insightful read (ISBN: 0321369440).

>>

```
Server: Microsoft-IIS/6.0
X-Powered-By: ASP.NET
```

Apache Tomcat (an open source Java servlet engine and HTTP server) sends:

```
Server: Apache Coyote/1.0
```

It's possible to override the HTTP header sent by the webserver to disguise what type of webserver you're running. For example, you could make an IIS webserver appear to be an Apache webserver by changing the HTTP header (using the IIS administration utility). This would cause a hacker or script to ignore a vulnerable server (thinking it to be another type), or attempt a completely futile exploit designed for another type of system.

Custom HTTP headers in IIS 6.0

Another obfuscation technique is to use alternative file extensions for dynamic scripts. For example, map JSP files to ASP, as this may mislead hackers about what technologies you've used to build your website. This can be achieved quite simply in most webserver configuration utilities.

Securing your site

Securing the infrastructure is a necessary first step to a secure website, but there are numerous other pitfalls that can befall a developer and render a website insecure. What follows are some basic precautions to avoid the common ones ...

Use encryption where appropriate

Data is sent and received between browser and server in a series of stateless "request" and "response" messages – a browser sends a request, and the server sends back a response. The format of these messages is defined by the HTTP protocol, which in turn rests upon TCP/IP: the basic plumbing of the internet (although HTTP could be implemented on top of other protocols as well).

These messages contain the HTML of a web page and the data from form postings in an unencrypted form. If a user between the browser and server is able to intercept the packets containing the HTTP data, they will have access to the potentially private data within

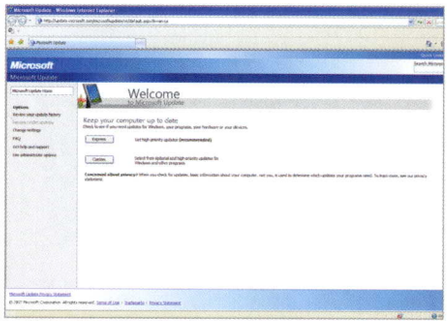
I wish I'd known that
(when I was a rookie developer)!

I wish I'd known more about how to create harmful SQL injection and XSS (cross-site scripting attacks). This would have helped me to understand the need for security measures ... yet nothing teaches you better than having to remove over a thousand inappropriate adverts from your client's message board. As a university lecturer, I teach my fledgling developers to hack and crack mail forms as soon as they learn how to make them. It's far better they learn this way than leaving it till they come to design a client site!

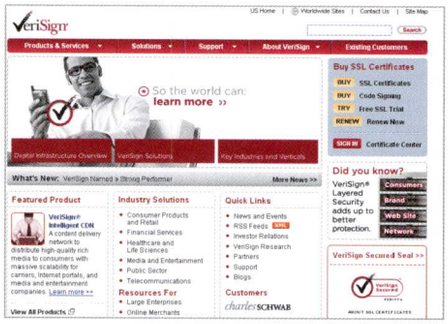
(Mog, www.mogmachine.com)

Every day, exploit attempts are made on my seven domains. I've learned that checking error logs will reveal these exploit failures. It won't bring a smile to your face, but it beats being oblivious.

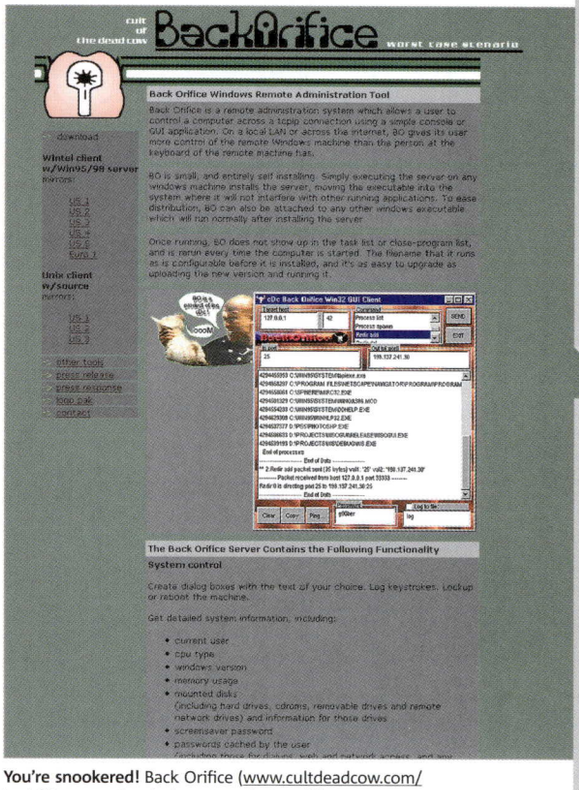
(Mike Cherim, GreenBeast.com)



Staying bang up to date Microsoft Update will ensure that your server has the latest Microsoft patches



Signed, sealed, delivered A digital certificate from VeriSign will enable you to encrypt your web traffic using TLS



You're snookered! Back Orifice (www.cultdeadcow.com/tools) is a remote admin system that enables a user to control a computer over a network

them. However, these messages can be readily encrypted through the use of the Secure Sockets Layer (SSL) or Transport Layer Security (TLS). TLS is the successor to SSL, but the protocol remains effectively the same. TLS (or SSL) encryption is handled by the webserver and browser and can be enabled by creating a digital certificate for the webserver. These certificates can be created using a tool such as OpenSSL, but these "self-signed" certificates will only provide a part of what's offered by a commercial certificate from a company such as VeriSign.

The other benefit of a certificate from a Certificate Authority (CA) such as VeriSign is that the certificate will act to validate the identity of the website. This is because each digital certificate is part of a "trust chain" that ends at the CA – and if the browser trusts the CA, it will trust your certificate as well. By default, all browsers recognise many CAs, including VeriSign.

Avoid URL hacking

Often, dynamic sites will retrieve data from databases based on criteria sent through a request using a "query string" in a HTTP GET request. For example, a site may have URLs like the following:

http://www.mysecuresite.com/accounts/ViewAccount.do?AccountId=1234

This URL is passing the primary key or identifier of an account as a parameter in the query string (1234). This URL may represent a valid way for an authenticated user to view their account details. However, a user might be tempted to try:

http://www.mysecuresite.com/accounts/ViewAccount.do?AccountId=4321

If security checks aren't made to determine which user has access to which accounts, this could be a very easy way for a fairly unsophisticated hacker to subvert your security.

A Certificate Authority will act to validate the identity of the website

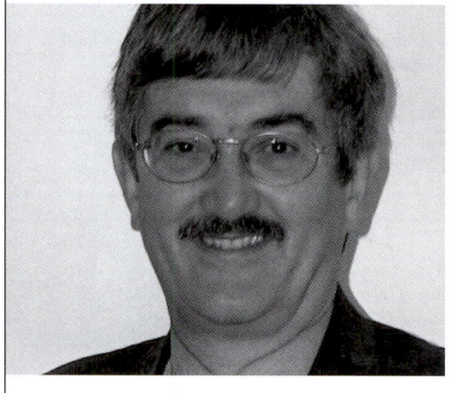
Avoiding faked form posts

A similar vulnerability can be exploited through HTTP POST requests. Many websites use hidden form fields to hold identifiers or other private information, such as this:

```
<input type="hidden" name="AccountId"
value="1234" />
```

A hacker could save a copy of the form locally and then change the identifier and repost it to your server. With inadequate precautions, a similar security breach to the query string approach could occur. >>

Forms and log-ins Richard Clark – Elysium



Make sure your web forms only work for you

It's easy to decide that the best way to keep your code maintainable is to use a single script to process the web forms that your customers have submitted, and pass the information through hidden fields on the form. If one of those fields is obviously an email address, you may have just created an open invitation to use your site as a spam source. Spammers can read HTML as well as you can.

Be very cautious in deploying software in its default state

There are many lists on the internet of default router and software passwords. Software vulnerabilities are also widely discussed by spammers and other malware providers, and your sites are being automatically scanned all the time by users trying to exploit any weaknesses in the software that runs them. Only deploy the software you need to operate the site correctly, not all the bells and whistles you may need one day. Forum software, for example, can be very effective and often offers many clever features. Sadly, it's not always rock-solid secure. A form that collects user details without a "captcha" (that forces them to enter the text from a distorted image) is an invitation to hackers to see what they can do with an automated registration to the site.

You can't control your customers' behaviour

Picture the scene: you've created a secure log-in to your CMS. However, one of your clients thinks it's amusing to demonstrate to their friends how they can alter their company's homepage with dubious content. Or imagine another scenario: a client visits an internet cafe in deepest Thailand on a PC, complete with a full complement of keylogging software. Now security is breached, and you have to track down what's happening. The more you can log, and the more specific that information is, the less likely it is that the client will suspect you and your staff (or your software) of being the cause of the embarrassing security breaches, and the less you will have to do to show them where you believe the problem lies.

Form tidy habits Rosie Sherry – Driven QA

Hackers (black or white hats) are creative and technical people. Successful hacks are put together like puzzles – small bits of information put together create one big picture.

Keep your code tidy

One of the first ports of call for a hacker is the source code within HTML/web files. In the rush to get a project out, it's easy to forget what's under the hood (or your site) or to deem it as low priority. Common mistakes include revealing notes and comments left in the code. Before launching any website or application, it's important to clean out any unnecessary or potentially harmful comments.

Error messages

Make error messages informative to help users, but don't give too much information away for hackers to use. A balance should be struck between usable and over-informative error messages. While you will want a legitimate user to understand the nature of the problem they're experiencing, you don't want to give a hacker revealing information. A typical example would be in a log-in screen. If a user types in an incorrect password, the error message shouldn't state that the password alone was incorrect, otherwise a hacker will know that the username was correct. Instead, it should state that the "attempt to log in was unsuccessful". This doesn't give away sensitive data.

Spam

Spam and "fake" websites are becoming more popular than ever, and spam emails are becoming more difficult to identify. The number of fake emails claiming to be from leading online banks or retailers is alarming. There has also been an increase in fake websites. Even leading experts have fallen into the trap of clicking on links that lead to harm. There are several things you can do to combat this:

- Report spam (usually to your email provider).
- If you're not sure, hover over the link within the email. If the domain/URL isn't the same as the email address provider, then it's probably spam.
- Delete emails from senders that you don't recognise.
- Keep your antivirus software up to date.
- Keep a close eye on URLs and make sure they relate to the website.
- Hover over links to see where they lead to before clicking on them.
- Be very careful with any website that asks for personal details.
- Don't trust every website you visit. Investigate them. Look up their postal address, company number, VAT number.

Recommended link:
The Open Web Application Security Project (OWASP)
www.owasp.org

An SQL injection attack exploits the failure to properly prepare database statements

Avoid SQL Injection

Another frequent mistake is to incorrectly pre-process SQL commands before executing them. Many websites use a database back-end, and dynamically generate the content by building up SQL queries based on user input – possibly through forms, or through query strings (as described above).

An SQL injection attack exploits the failure to properly prepare database statements, and enables the attacker to execute arbitrary SQL commands of their own on your database. Not an ideal situation by any means.

The attack relies on the use of so-called "escape sequences" in SQL. If these are not filtered out through application logic, they can change the meaning of an SQL statement significantly. Commonly, a single quote is used to delimit strings in an SQL statement. Imagine a log-in form that takes a user name and password from a form and authenticates the user against the content of a database using:

```
"SELECT * FROM users WHERE username = '" +
                                    username + "'"
```

In the example above, username is a variable that contains the content of the username text control on the form. If the user entered:

```
"a' or '1=1'"
```

Resources RSS Feeds

CERT
Stay up to date with the very latest computer security information from CERT/CC (Coordination Center), which is part of the Software Engineering Institute program formed in 1988.
www.cert.org/channels/certcc.rdf

Djeaux
Regularly updated computer security news feeds are available at the djeaux website, with new RSS feeds "scraped" from the seclists.org mailing lists on a regular basis.
djeaux.com/rss/insecure-full-bugtraq.rss

TechNet
Microsoft's extensively catalogued reference for security issues is a definite must for your RSS reader. It links to technical bulletins, updates, tools and advisories to help you stay bang up to date.
www.microsoft.com/technet/security/bulletin/secrss.aspx

SecurityFocus
The latest security-related news, plus regular columnists, blogs and features. In fact, if you want a career in the security industry, this website should be on your job search list, too! A quality resource.
www.securityfocus.com

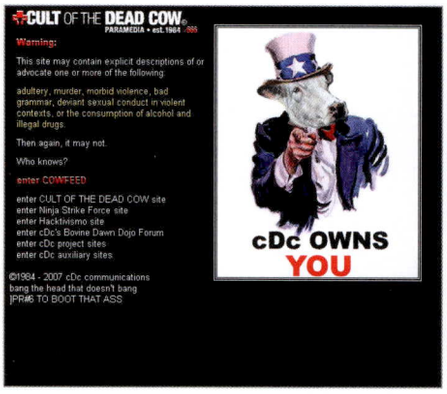
Ask yourself ...

Mathew Currie
First Choice Holidays

Don't trust your own security. Never think "I'm safe". Have security tested by specialist external parties and have it viewed by fresh eyes at least every six months.

Security doesn't end at your firewall or operating system. Does the functionality of the system make it secure or does it invite an attack? What's the quality of the data you're gathering? Are you sure about the address you're delivering the package to?

If you don't need it, remove it. Reduce the attack surface by removing everything you don't need.



Going Live Windows Live (www.live.com) is Microsoft's progressive revamp of the Microsoft Network

into the form field, the resulting SQL command would be:

```
"SELECT * FROM users WHERE name = 'a' OR 1=1'"
```

Oops! This will return users no matter what, as this always evaluates to true and causes the log-in to be bypassed.

This classic SQL injection attack is by no means the worst. A sophisticated attack can cause multiple queries to be executed, including update and delete statements.

The key to avoiding SQL injection is to ensure that all parameters passed into SQL commands are pre-processed to remove escape sequences before passing them to the database. Alternatively, avoid using this approach altogether and use one of the following alternatives.

If your database supports it, use prepared, parameterised queries, as these will generally automatically strip the escape sequences.

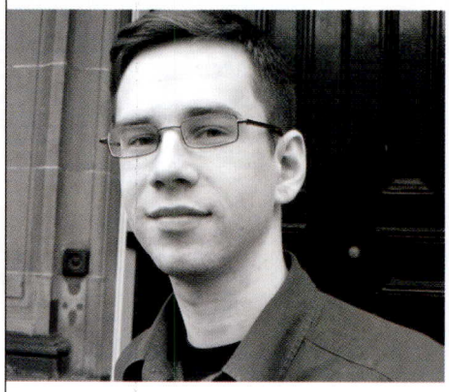
Use a tool such as Hibernate (www.hibernate.org) to abstract your data access code from your application code. This will avoid SQL injection attacks and offers numerous other benefits to your application that are outside of the scope of this article.

Summary

The techniques to thwart web security violations are as varied as the threats themselves, and implementing them requires a disciplined approach from architects, developers and systems administrators alike. The time (and therefore money) that could be spent securing a website is potentially limitless, so a balance must be struck between the degree of risk and cost of mitigation – just as we strike a balance on our personal security or the security of our homes. Most houses can be easily burgled by a determined burglar, so unless you own a valuable art collection and prefer to live in Fort Knox, some degree of compromise is accepted by most people. The same view should be taken for a website. Too much security might be a waste of money, and if the techniques are intrusive upon the user experience of your site, you may end up discouraging your genuine customers or users. ●

WWW. *Share your own thoughts about internet security at forum.netmag.co.uk*

Avoid the "man in the middle" Fraser Nevett – Mercurytide



Use a secure connection when appropriate

When data gets sent over the internet, it usually travels across many networks and passes through a number of routers and servers. On the most part, these devices won't look at what's being sent, they'll just monitor the amount of bandwidth being used. However, it's always possible that somebody could maliciously take control of one of these machines and listen in on your communication. This is known as a "man in the middle" attack.

Another potential issue when using the web is how to know whether the site you're using is what it claims to be. For example, can you be sure that if you type www.amazon.co.uk into your browser that the site you see belongs to Amazon, or if someone is spoofing it?

> "Can you be sure that if you type Amazon.co.uk into your browser that the site belongs to Amazon?" Fraser Nevett

Both these potential dangers, and others, are addressed by using a secure connection. The URLs of secure websites start with https://, and if the connection is secure, your browser will show a closed padlock icon to indicate this.

HTTPS uses SSL (Secure Socket Layers) encryption technology to scramble the data at the end points of communication. This means that only the client and server (eg the end points) can decipher the information, and any other devices in between simply pass it on without being able to tell what it is. This technique mitigates the dangers of a man in the middle attack.

HTTPS also makes use of signed certificates. When you're on a secure web page, double-click the padlock icon and you'll be able to view the certificate of the site. Certificates can only be issued by certain authorities. This is supposed to ensure that certificates can't be fraudulently created, though nowadays, the reliability of certificate authorities isn't necessarily guaranteed. The majority of HTTPS certificates are used to identify a server, but technology exists to enable users (or "clients") to have certificates to identify themselves to a server. Some national ID card schemes provide the means to store a client certificate on the smart card's chip, thus allowing a citizen to securely identify himself or herself online.

Whether you use a secure connection or not depends on the type of data you're dealing with. If you wouldn't shout the information you're entering or displaying on a web page across a crowded room, then a secure connection should be used.

Sanitise user-generated content

If you enable users to post content on your site, it's important that you sanitise it before using it, especially before publishing it for public consumption. This applies to text, images, movie clips and other files.

If you allow visitors to your site to submit comments to your blog posts and subsequently show these on your site, you should make sure that they can't enter raw HTML. If you don't do this, people could, for example, add <script> elements to either redirect users to another site or to maliciously capture information about them using a technique called cross-site scripting. The simplest way to sanitise such data it to replace all < and > characters with < and >, though you could do something more complicated if you wanted to allow a minimal set of formatting elements.

The problem doesn't lie solely with text and HTML. There have been a number of problems found with graphics libraries, where a specially crafted image or movie clip has been used to maliciously target users. Before displaying such media, it's sensible to pass it through a graphics library to verify it's a valid image or video, and then to use the library to resave it.

Not only is it important to sanitise content before displaying it on your site, it's also essential to appropriately escape values before writing them to a database. Failure to do so could lead to so-called SQL injection exploits, allowing attackers to tamper with your database. Most web frameworks have a database abstraction layer that takes care of escaping for you automatically.

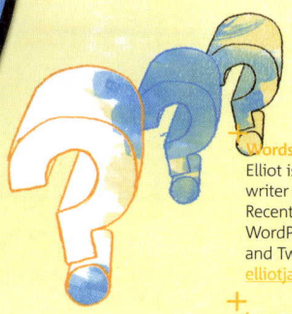
Keep up to date

The world of computer security is changing continually, so it's important to keep up to date with the latest information on recent exploits. If you're interested in security, then Security Now! is an excellent weekly Podcast that covers a wide range of security topics www.grc.com/securitynow.

DESIGN THIEF
ALL OF YOUR IDEAS
???
Sneaky
PINCH!

Thwart the design thieves

You've spent time and effort creating a beautiful site, only to find it's been ripped off by a rival. Is there anything you can do? **Elliot Jay Stocks** canvasses the industry's top designers for their ideas ...



Words **Elliot Jay Stocks**
Elliot is a designer, writer and speaker. Recent clients include WordPress, Blue Flavor and Twiistup.
elliotjaystocks.com

Image **iLovedust**
iLovedust is a multi-disciplinary studio producing creative solutions for print and web.
ilovedust.com

What designer doesn't love flattery? That warm feeling inside when members of the general public shower your work with praise is something we all strive for. Web designers are at a great advantage for 'getting out there' because our work, by its very nature, is meant to be consumed by the public. From the minute we upload it to a server, it's immediately viewable by all and we love that.

But there's a flip-side to this coin. The immediacy of web design also opens it up to be copied. The nameless public who throw praise your way suddenly become the nameless designers who copy your work. They say imitation is the highest form of flattery, but what happens when the imitation is nothing more than a direct copy? Your website – your hours and hours of hard work and effort, along with all those difficult design decisions you made along the way – is suddenly sitting on someone else's domain. That individual might have made little more effort than to copy and paste, and now they're reaping the benefits of your creativity. >>

>> Some say that this is still flattery; that to be copied means you're at the top of your game. Your work is in demand, your style is what people want, and imitation – even that of the shameless, copy-and-paste variety – shows that you're looked up to. Ah, there comes that warm feeling again ...

But should we just grin and bear it? Should we let some copying go and relentlessly pursue others? Where's the 'inspired by' line, and when is it crossed? Is there any way we can prevent rip-offs from happening before we find them in the wild?

These questions and more have plagued me for some time, as there have been numerous instances of my work being imitated. These range from being respectfully influenced by my work (the kind that invoke the warm feeling and a sense of pride) to the downright ridiculous rip-offs where the 'designer' has lifted the image files directly from my server (the kind that induces less of a warm feeling and more of a Hulk-like rage).

I've posted a few examples of the latter on my blog and found that this often resulted in the offending designs being taken down. However, the comments that were posted on these blog posts made it obvious that opinion was largely divided on the issue.

I was confused, too – was naming and shaming the best option? Where could I go if this approach didn't work? And what could I do to stop the theft happening in the first place? Fortunately I'm not alone, so to discuss this further, I contacted some of the web's biggest designers to get their opinions on the matter.

Drawing the line

One of the hardest things about 'drawing the line' is defining the difference between 'stolen' and 'inspired'. "Unfortunately, stealing on the web is facilitated by the convenience of lifting code," notes Dan Cederholm (simplebits.com). "It's just too easy to do, and some people can't help themselves." To Shaun Inman (shauninman.com), "A stolen design is one with only superficial changes, such as logo insertion and colour-swapping, while an 'inspired' design's source material is suggested instead of quoted verbatim." Kyle Meyer (typesites.com) believes "inspired work tends to form trends, such as the legions of gloss and rounded corners spawned largely as inspiration from Apple".

Khoi Vinh (subtraction.com), like every designer I spoke to, believes it's a grey area. "However, I'd say that something is 'stolen' when the result still looks like it belongs to the author/creator of the source material. And something is 'inspired' when it looks like it reflects the values and ideas of the person who was inspired by the source material." Rob Weychert (robweychert.com) defines the two nicely: "To be inspired is to create something new by finding a way to associate two or more things that were previously separate. To steal is to call someone else's inspiration your own."

Paul Boag (boagworld.com) believes that it's difficult to draw a nice neat line. "If in doubt about whether you've overstepped the mark, my recommendation is to speak to the website owner who has inspired you. Ask what they feel. I occasionally get people asking me if they can use some element of my site and I have yet to say no."

In the creative world, it's impossible to be totally original: the closest we can get is innovating with the inspirations and influences that we have. "There's a long tradition of 'creative borrowing'," Miguel Ripoll (miguelripoll.com) points out. "The ultimate example is Picasso's series of paintings on the Meninas, or Bacon's portraits of screaming cardinals inspired by Velazquez."

However, some sites are guilty of wearing their influences on their sleeves too openly. What can we do when we find our own work within them?

> "Stealing on the web is facilitated by the convenience of lifting code. It's just too easy" Dan Cederholm

Drew McLellan (allinthehead.com) advises: "Send an email to any contact address you can find, politely explain that the work is an unauthorised copy, and ask for it to be removed within a reasonable timeframe." Jon Tan (jontangerine.com) agrees: "In the first instance, this is an appeal to the better nature of people." And when you have perpetrators in the same country, as Andy Clarke (stuffandnonsense.co.uk) often finds he does, "I simply pick up the phone and tell them in no uncertain terms that I've caught them out."

Presumed innocent

It's worth remembering the 'innocent before proven guilty' rule. As Drew McLellan reminds us, "Sometimes it can be the case that the owner of the site didn't do the stealing themselves and is as much of a victim as you are, so be clear, reasonable and polite in the first instance."

Unfortunately, emailing the offending party doesn't always work, says Shaun Inman. He prefers the name-and-shame route followed by so many other designers. "It shouldn't be the victim's responsibility to rehabilitate the thief," he argues. "They've already displayed a disregard for our time and effort, so they aren't worth wasting any more on." Although Jeff Croft (jeffcroft.com) doesn't personally recommend this approach, he concedes that, "Public shaming works every time. If you embarrass someone, they're likely to change their ways. If this fails to yield results, another form of action might be to contact the domain registrar or the web host."

With the option to 'view source' on XHTML/CSS-based sites, it would seem that those of us in the web standards community are slightly more at risk than those working with Flash. As

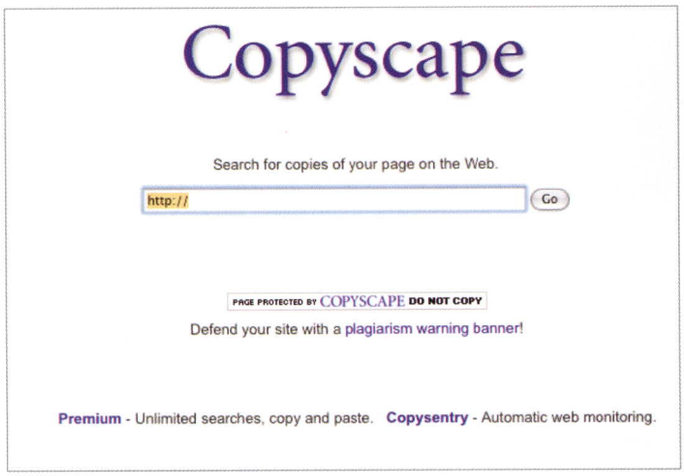
What does the law say?

Struan Robertson, legal director at Pinsent Masons LLP and editor of internet law advice website out-law.com, gives us the benefit of his experience.

When images are copied, infringement is easy to prove. When code is copied, it's sometimes easy to prove. While there are only so many ways to write code to perform a certain routine, any copying of bugs or comment lines can be a dead giveaway. Putting the odd typo into your comment lines makes catching lazy plagiarists a simple affair.

It's harder to prove copying when your argument is simply that someone else's site looks a lot like yours. To prove infringement you have to convince a court that someone copied a substantial part of your work, work that took skill and effort on your part. That's always a matter of degree and if you're focusing on the aesthetics, not the code, the degree of resemblance has to be judged by the eye.

There has to be sufficient originality in your work for it to merit copyright protection in the first place, but assuming there is (and the bar is low – almost anything original will qualify), copying its look and feel will be infringement. Proving it is tricky, though. The defence argument might be: "I came up with this design all by myself – it's just coincidence that it looks the same." If true, that's a valid defence.

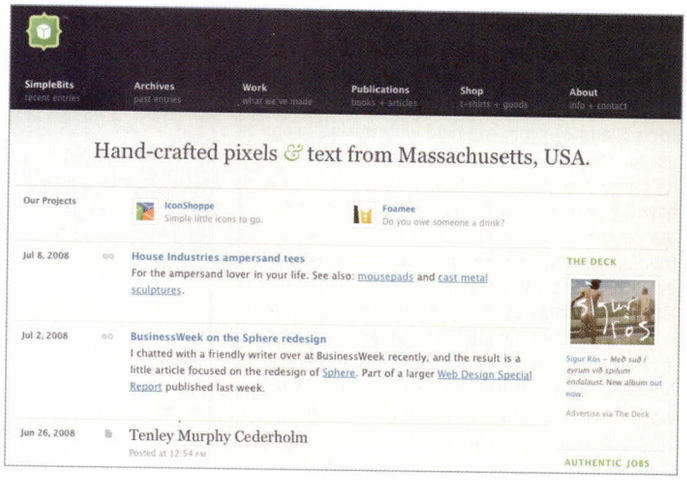


Above Paul Boag is more concerned with visual design plagiarism than the theft of code

Left Copyscape allows website owners to search the net for plagiarists (www.copyscape.com)

Above Jonathan Snook feels that learners lifting code is to be expected and should be forgiven

Right SimpleBits had its design mimicked by a stock logo site, who then used it for their own profit



Jonathan Snook (snook.ca) says: "It's simply easier for beginners to get to the website's assets." Of course, there are a few ways around this. "Using a minifier to crunch any whitespace etc out of JavaScript and CSS is a good way to discourage copying," says Drew McLellan, "But it comes at the cost of discouraging the 'view source' tradition on which the web has been built."

Paul Boag believes that Flash-based sites are still easy enough to rip with the right decompiler, but advises: "We shouldn't allow a fear of plagiarism to dictate the technologies with which we develop," he says. Dan Rubin (superfluousbanter.org) agrees, and adds that: "Only the code is easier to copy from XHTML/CSS. If we're talking about the visual design itself (rather than the interaction, animation, etc) then it's easy to recreate a design no matter how the original designer created it."

Copyrighting code

The subject of asserting copyright over code is a difficult one, because there are many standard practices for certain actions with CSS. "However, an author can achieve a given phrase with a variety of words in much the same manner as a coder can create an aesthetic with lines of code," says Kyle Meyer. If an author can copyright his arrangement of words, why not a coder?

Other designers disagree. Dan Cederholm isn't bothered about other people using his code for their own layouts: "It's the visual design and branding that I'm most concerned about," he explains. In fact, Paul Boag doesn't feel that his code is truly his own to copyright: "After all, I've learned much from other people's code and from those who have actively taught me best practice," he says. Shaun Inman believes that copyrighting code would be a very bad thing. "Imagine if you had to license a paragraph element, a link element or an image replacement technique," he argues. "Lack of openness doesn't scale."

> "I search for inspiration elsewhere, rather than looking at websites" Miguel Ripoll

Client demands

Rip-offs aren't all about external thieves. Some clients request near-exact copies of other designers' work. Kyle Meyer suggests we "explain the importance of being unique and the legal implications". A similar approach can be taken when a client asks for a site that is 'like' another site. In this situation, Paul Boag will "encourage the client to articulate what it is about the site that they like and why. I then ask them what about the site is not appropriate or how it could be improved. Before long, their initial desire has evolved into something unique."

Jeff Croft is also keen to demonstrate the disadvantages of copying another design: "I'm a designer, and a client is paying me to come up with a button style and imagery that's appropriate for their own site," he points out. "If they have me 'steal' a design element from someone else, then they're not using the design skills they've already paid for."

The situation is challenging, and it usually comes down to refusing the project or attempting to educate the client about creating something unique. As Jon Hicks (hicksdesign.co.uk) notes, "Clients often provide examples to demonstrate what approach they would like, which is good. The skill of the designer is to interpret those examples." Sam Brown (sam.brown.tc) adds: "This is where you have to combine your creativity with satisfying the client, while not offending anybody else in the process."

Miguel Ripoll brings up the other scenario that can occur: "Sometimes clients ask me to copy myself, which is indeed a temptation for any creative, and one we should resist. I have a number of influences, references and inspirations I weave into my work, like I suppose everybody else does. I search for inspiration elsewhere; rather than looking at websites I go to museums, or read books about typography, architecture, interior design and furniture design."

Does the problem come down to the fact that design thieves simply don't understand the notion of copyright? "Some people seem to think that if the design is visible on the web, it's free for them to copy and use," says Jon Tan.

Andy Budd (andybudd.com) feels there's a big gap in people's understanding of copyright in general: "If a designer hands over copyright to a client, they could be losing the right to re-use any of it in the future." He feels it's better to grant clients a licence rather than copyright. "Handing over copyright gets even more complicated if parts of the design use licensed images or stock icons, or parts of the code use Javascript libraries or CSS frameworks. In truth there are very few situations where the client actually needs copyright anyway."

Jeff Croft highlights the misunderstanding of copyright concepts among designers. "I constantly hear people talk about 'copyright' in instances where they should be using 'trademark' or 'patent'. Simply creating an original work is enough to copyright it, as long as that work falls under the scope of copyright law."

The importance of placing a 'copyright' symbol – and possibly a 'copyright notice' >>

Getting copyright right

Stephanie Burns of Withers & Rogers LLP (www.withersrogers.co.uk) explains how a proper understanding of copyright law can help you protect your website.

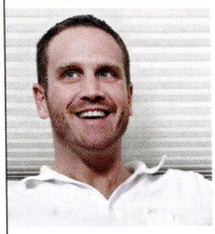
Designers should always assert that their work is protected by copyright by using the © symbol on their page, in the format '© YEAR OF PRODUCTION, AUTHOR'S NAME'. This educates the public that you're asserting your copyright over the work.

Copyright is an unregistered right in the UK and so designers should be careful to ensure that they explicitly assert their rights in order to gain protection. If a work in which copyright subsists was produced by an employee in the course of business, then ownership of the copyright will rest with the employer. However, if the worker produces the work under a commission, he will typically be the owner of the copyright, unless there is an express agreement to the contrary.

In order for a work to attract copyright protection, it must be original and emanate from the author. The general test for originality is that you must be able to prove that the work involved a level of 'skill, effort and judgment' in its creation.

Copyright is infringed by anyone who does any of the following acts that are restricted by copyright, without the consent of the owner – copying of the work; issuing copies of the work to the public; renting or lending the work to the public; performing, showing or playing the work in public; communicating the work to the public or making an adaptation of the work. This is all covered by s.16(1) of the Copyright Designs and Patents Act 1988, which is the primary Act in relation to copyright law.

The stock photo scammers



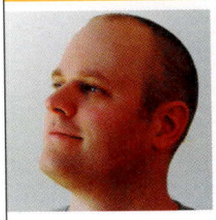
Designers aren't the only ones getting ripped off. Kelly Thompson, executive vice president at iStockphoto, examines the misuse of its stock photography catalogue.

We had a competitive site reproduce an entire best-selling series down to the minute details. We eventually got them to remove it under threat of legal action. Even iStockphoto's intellectual property isn't safe. Recently, a UK company copied a patent-pending feature from the iStock site. Even the interface and name was duplicated.

There's certainly a misunderstanding of copyright in the web world. We see over and over that people don't understand they just can't take content from places like Flickr or Google Images. Tools like tineye.com can help with tracing image usage. You can upload an image and see where it's being used on the web. At iStockphoto, we have some technology in place that helps, and our contributors really help as well. Because there are 55,000 of them, they eventually see everything! If they report it to us, we have our legal team follow up as is appropriate.

The difference between 'stolen' and 'inspired' is often a bit of a gut feeling: when something has been 'inspired' you can appreciate the new work that's been put into it while accepting where it came from. When you find an offending piece of work, I believe that taking a calm approach and asking the offending party to remove it often works.

The logo saga



Designer Dan Cederholm explains how he suffered at the hands of a stock logo company that mimicked his SimpleBits branding on their site.

This one was particularly infuriating because not only did they steal the design, but they were selling it for profit. It's one thing to find your site template being used by someone trying to learn web design, but to find another company profiting off the labour of others is just terrible.

I posted a screenshot to Flickr without explanation, and then a firestorm of comments from the community and the logo company's founder ensued. What was interesting here, is that despite the obvious rip and investigative actions from the Flickr community, the logo company wouldn't back down. They went on to claim that perhaps I had stolen the logo from them. Eventually, they came around to admitting it, using the typical response of 'It was a contractor that stole it'. This is often what we hear when confronting a guilty party – but usually we hear this right off the bat. And not after a long public discussion that embarrassed the thieves.

The sad part is this: if the logo company had come right out and admitted the theft with an apology, I'd have had no problem with it. Heck, they might have even come out of that mess with some positive PR!

page – on one's site is a sure-fire way to *assert* copyright, and is recommended by all the interviewees. Of course, whether it's respected or not is another matter.

Some believe there's nothing we can do to prevent design theft, because, as Rob Weychert points out, "It's all down to the medium. For all its merits, it's ripe for abuse, and you can't really protect your stuff from thieves without also protecting it from everyone. I, for one, am more interested in making my work accessible to everyone else than making it inaccessible to a minority of miscreants." Drew McLellan believes there's still comfort we can take, even if our work is stolen. "What they can't steal is the ability to create the next, even better design. That's what makes the designer a designer – talent and skill."

> "Some amateur thieves don't know they are thieves. They must be educated" Rob Weychert

Don't worry – be happy

In December 2007, industry pioneer Jeffrey Zeldman (zeldman.com) posted on his blog: "Don't worry about people stealing your design work. Worry about the day they stop." This sentiment is shared by many designers. Often it comes down to whether or not the infringing site is making a profit from your work.

Jonathan Snook is keen to forgive: "There are new people entering our industry every day and they all need to go through the same learning process." Jon Tan believes good design should propagate. "No designer can own a style, in the same way that no one person can own an accent. Both are products of context, influence and inspiration." However, he adds that the right to create derivative or inspired works has to be balanced with the rights of designers and their clients to protect their work.

"Some amateur thieves genuinely don't know they are thieves," Rob Weychert points out. "They need to be educated. Other thieves know exactly what they're doing. They need to be destroyed."

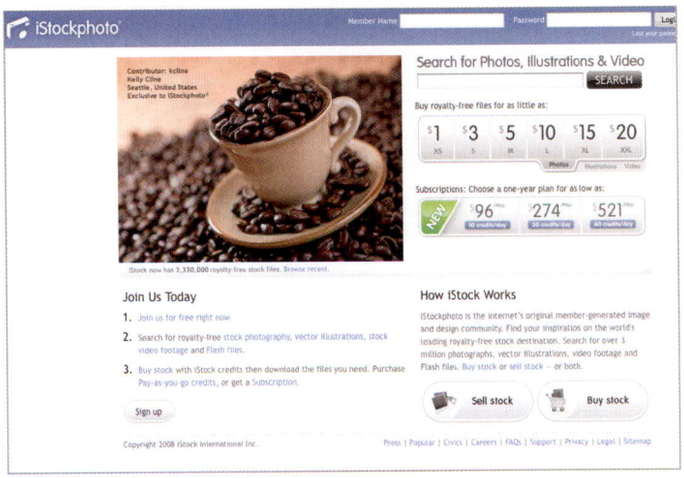
It's not just about being fair, however. Paul Boag emphasises the fact that in most situations, it's simply not worth the time and effort. "Are they a threat to my business? No. Why waste my time trying to get them to remove copied designs? Those who rely on stealing from others will not survive as a business." As Keith Robinson (dkeithrobinson.com) reminds us, "Good design is often made with a great deal of inspiration. Too much worrying about this would be bad for all designers."

Andy Budd has tried all of the prevention methods mentioned earlier, but these days remains fairly philosophical: "Life's too short to worry about these kind of things!" Dave Shea (mezzoblue.com) is also keen to point out that "It's often not worth worrying about, given the small percentage of people who will actually view the offending copy. That tiny percentage is just the inevitable cost of being a designer."

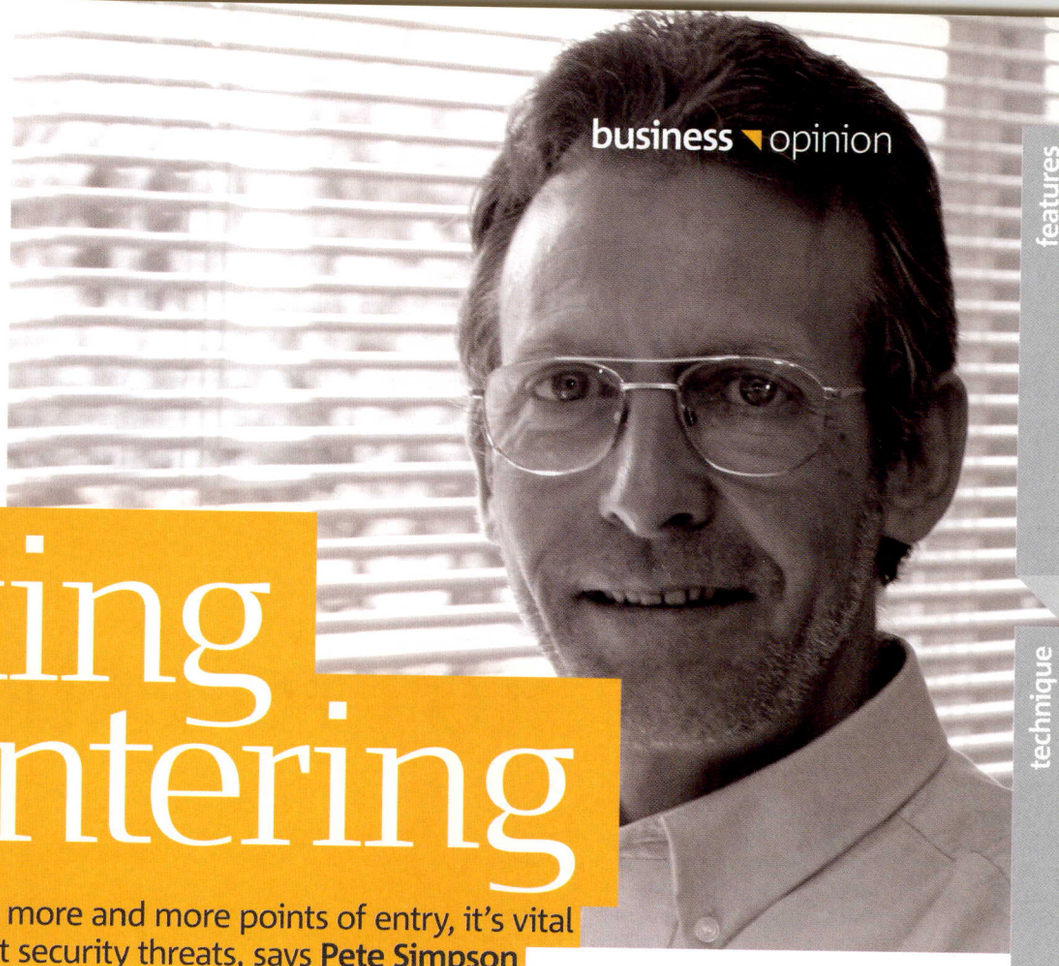
I'll leave you with the words of Dan Rubin, who feels we should treat each instance on a case-by-case basis. "Ultimately it comes down to the designer whose work has been copied. If you decide to take it as flattery in one case, file a formal complaint in a second, and take legal action in a third, that's your right." ●

Above Keith Robinson believes that worrying about design theft can hamper your creativity

Right iStockphoto uses image recognition software and the eyes of its 55,000 users to watch for copyright infringements



WWW. *Have you had your code or designs ripped off? What, if anything, did you do about it? Share your experiences at forum.netmag.co.uk*



Pete Simpson on ...

Breaking and entering

With malware writers discovering more and more points of entry, it's vital for web developers to know about security threats, says **Pete Simpson**

Reports that web developers' pay is bearing up well during the recession should come as no surprise. After all, the popularity of social networking sites seems ever-increasing. Facebook is continuing to grow exponentially around the world and Twitter is hot on its heels. This zeal for all things interactive has seeped into the online community's consciousness and, as a result, organisations and businesses are clamouring to implement their own Web 2.0 functionality.

While such an increase in web traffic is a boon for the industry, it does have its downsides. Interactive sites use open source Ajax coding, which gives malware writers considerably more points of entry than traditional HTML coding. The problem is further exacerbated when web developers don't possess enough security knowledge to deal with new advances in the industry, and unwittingly leave sites – and the end-user – open to attack.

So what threats are web developers now facing? As mentioned, Ajax is a key cause of increased security breaches on the web. A traditional web application can be compared to a house with just one front door and no windows, in that it offers only one point of attack. On the other hand, an Ajax application constantly exchanges small amounts of data between the browser and the server, which creates many points of input. The inputs provide more opportunities for attack; as well as the front door, the house has numerous windows, all providing a break-and-entry point.

> "Holes in security mean that sites such as MySpace have turned into goldmines" Pete Simpson

Of course, it's this open source technology that enables the interactive functions on a website to exist, and it would be ridiculous to suggest erasing such functions to retain a secure website. Instead, the security industry must share its knowledge with web developers so that precautions are taken to prevent Ajax-based sites being hijacked.

Targeting Web 2.0 sites

Web 2.0 technology has exploded so fast that it has been impossible for the IT industry to keep up. Right now, 71 per cent of UK office workers aged 18-29 access Web 2.0 internet sites at least a few times a week, and it's these sites that have gained the most popularity with phishers and hackers. In March 2007, for example, Google's Online Security blog noted that the number of page views generated on phishing sites increased fivefold, with 95 per cent targeting MySpace. Holes in security mean that sites such as MySpace have turned into goldmines: the injection of a simple CSS code into a profile is all it takes to infect the page, so that wherever a user clicks, even on what appears to be a legitimate link, they're redirected to a phishing page.

Many users have the same login credentials for social networking accounts as they do for banks and web-based mail. This creates a domino effect and enables a user's online identity to be fully compromised. If web developers are unaware of how to prevent such security breaches, the web will grow increasingly unsafe and, as a result, the positive aspects of the Web 2.0 revolution will be seriously undermined.

One successful hacker – Lithium – has been quoted as saying: "Lazy web developers are the reason I'm still around phishing." However, the blame cannot be laid solely at the door of web developers. On the contrary, it's the training they receive that's a major part of the problem. It seems that the provision of security training varies from course to course, with some teaching very little on the subject at all! Web development courses should teach would-be developers that the key to ensuring consumer confidence in the web is to make a site as invulnerable as possible from its conception. To do this, developers should make sure that all input is sanitised and all points of input are as secure as possible. Up to date advice on security best practice, technical documentation and free, secure source code can be found at the Open Web Application Security Project (owasp.org).

Within the next year, it's likely that the IT community will see more incidents of Ajax-borne threats, which should hopefully be enough to raise developers' awareness of this issue. Everything that web developers need to know initially to produce safe, secure websites can be taught in two days, but after this, it's up to the developers themselves to keep tabs on the latest security threats and developments. It's a professional responsibility.

Pete Simpson, ThreatLab manager at Clearswift, has been an IT security professional for 18 years. He joined Clearswift in 1999 to set up ThreatLab, a unit tasked with researching content-based threats.

WEB PRO

Security

Prevent people from getting hold of your personal information by choosing the right passwords and hiding your browser history, advises **Mike Williams**

Password protection

Password-protecting a web account, zip file or other document can make you think your data is invulnerable to hackers, but that's not necessarily true. A great deal depends on the password you've chosen. Select something that's easy to guess and you have no real protection at all.

You might think that's obvious, something everyone knows, but it seems to be a message that many people are choosing to ignore. When the website phpbb.com was hacked, around 20,000 passwords were published online, and analysis has shown that many of the passwords were surprisingly obvious.

Around three per cent of the phpbb users had a password of "123456", for instance. We suspect this was the most popular choice because most apps and websites demand at least six characters for a password. It's likely that these people use the same sequence elsewhere, too.

Many other passwords were variations on this theme ("123", "1234", "12345"), or simple and very obvious keyboard sequences ("123123", "abc123", "qwerty"). In fact, these made up around 15 per cent of the total.

About the same number of users chose common first names as their password. This could be their own name, a family member's, maybe a celebrity's – but whatever the inspiration, it's not a particularly secure idea.

Perhaps 10 per cent of users selected some kind of jokey response to the original "enter your password" demand. Two per cent actually entered "password". Others used variations like "passwd" or "password", movie passwords like "letmein", or semi-conversational responses along the lines of "nothing" or "fuckoff".

Seven per cent opted for a password that presumably related to some kind of personal interest, like "starwars", "tigger" or "arsenal". If you've listed your favourite things on a social networking site then that could give attackers everything they need to break your password.

More than half of the phpbb users made reasonably predictable password choices. Perhaps some would opt for more secure phrases if they were encrypting confidential data, but it's reasonable to assume that a large number would not, and so any benefit these people think they're getting from password protection is entirely illusory.

Sounds like you? Then you need to change. At an absolute minimum, embed two or more numbers inside your password: "passw78ord" is vastly better than "password" alone. But ideally, think of two pronounceable nonsense words to which you can add numbers, like "hableyjunter2", so they're relatively easy to remember but quite impossible to guess. Or let Xyzzy (www.haxial.com/products/xyzzy) generate them for you.

Nonsense maker
Xyzzy comes up with memorable passwords such as "heckmend" or "owseltit" in one click

Mike Williams' recommended...

Password advice

Name What's My Pass?
URL whatsmypass.com/?p=415
Info This page lists 500 of the most commonly used passwords. If any of yours are here, you need to change them – and not just by adding a "1" to the end (hackers know that trick, too).

Name Real-World Passwords
URL tinyurl.com/ybqxms
Info Bruce Schneier's 2006 analysis of 34,000 MySpace logins shows that hardly anyone used long passwords. Using 15 or more characters is likely to offer you significant protection.

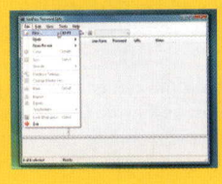
Name Choosing good passwords
URL www.auscert.org.au/render.html?it=2260
Info The Australian Computer Emergency Response Team has a series of useful tips. Don't reverse words, for instance, and don't replace letters with similar looking numbers (eg 1 for l).

On test

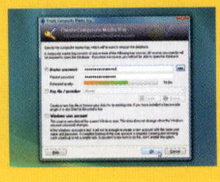
Manage your passwords securely

Generating a quality password isn't enough to ensure your security. You also need different passwords for every website and application you use. So how are you going to remember them all? The simple answer: you're not. Instead, install a password manager such as KeePass to handle them automatically.

1 Download, install and launch KeePass (keepass.info). Click **File > New** to create a new database where all your passwords will be stored.

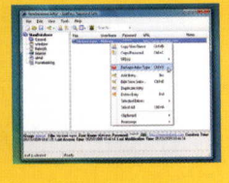


2 Enter the master password for your database. This secures all other passwords, so enter something no one else can possibly guess. Click **OK > OK**.



3 Select a password category like **Internet**. Click **Edit > Add Entry**. Enter a site's details (username, password, log-on URL and a descriptive name).

4 Open the log-on URL in your browser, switch to KeePass, right-click the entry and select **Perform Auto-Type**. It'll automatically enter the password for you.



Get anonymous browsing – for free

Online privacy is the latest battleground in the browser wars, with Microsoft, Mozilla and Google all claiming they deliver the best possible protection. But there's a problem. No matter what any browser does to prevent the download or storage of cookies, ads or scripts, your IP address is still given away to every site you visit, and so your activities can still be tracked.

One solution is to use an anonymous proxy, a server that sits between you and the rest of the web. Enter a URL into your browser and this is passed on to the proxy, which fetches the content and passes it back to you. Any website you visit will only see the IP address of the proxy, and so has no way to know that you're the real visitor.

Anonymous proxies can be effective, but they'll also have an affect on your browsing performance. Channelling everything through the remote server can really slow you down, especially if it's free and clogged with users. Commercial services are better, but expensive. And unnecessary – because we've found a better way.

At first glance Toonel.net (www.toonel.net) looks like most other anonymous browsing tools. Download the application, run it, tweak your internet apps and it'll redirect your traffic through a third-party server: all very familiar.

But look again. This isn't some intrusive applet that makes a permanent home in your system tray, or risks clashing with other network software. It's a simple Java tool that anonymises your browsing only when it's running: close the program down and everything's back to normal.

Toonel.net isn't just about online anonymity, either. As your traffic passes through its server it's also compressed (images too – see 'Getting started with Toolnel.net', below) which, depending on your settings, could reduce the amount of data you download by more than half. And so, while other anonymous browsing tools slow you down, Toonel.net could significantly improve your browsing speed.

There are even versions of Toonel.net that run on Macs, handhelds and some mobile phones, so it works just about everywhere.

Perhaps the most surprising aspect of Toonel.net is that it's free. No, it makes no sense to us either – they could easily charge for it – but let's not ask questions. Go download a copy right now before they change their mind, and see below for instructions on what to do next.

Mike Williams' recommended...

Anonymity services

Name Proxify
URL proxify.com
Info If you only need anonymous browsing occasionally, then this web-based proxy should be sufficient. Choose the privacy options you need, enter the site URL and click Proxify to begin browsing.

Name Ninja Cloak
URL ninjacloak.com
Info Ninja Cloak is another web-based proxy service that makes it easy to visit particular websites from within a browser. It's not trying to sell you a commercial version, so there's none of the annoying restrictions that affect the competition.

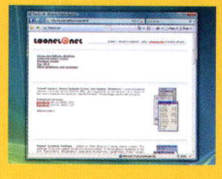
Name The Tor Project
URL torproject.org
Info Routes your internet traffic through not just one but several relays, changing them constantly to avoid tracking. You can even use Tor to run a web or FTP server without revealing its IP address.

On test

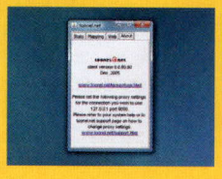
Getting started with Toonel.net

Most anonymous web browsing tools are incredibly difficult to set up, with multiple components each offering a bewildering range of complex configuration options. Toonel.net is very different, though, and even novice computer users should have it up and running with just a few minutes' work. Here's what you need to know to get using it today.

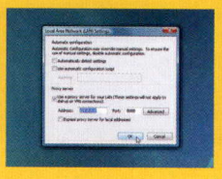
1 Point your browser at Toonel.net, click Downloads and download the Toonel Generic Swing Package to a new folder on your hard drive.



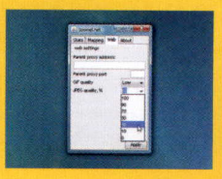
2 Double-click the downloaded Toonel.net file and you should see the program console appear. You don't? Make sure your PC has Java installed.



3 Your browser will use Toonel.net once you've configured it to access a proxy server on 127.0.0.1, with the port 8080 (see www.toonel.net/support.html).



4 Click the Toonel.net Web tab and enter low GIF/JPEG quality settings. The program will lower image quality, cutting file size and improving browsing speeds.



/expert_advice

Web pros answer your questions

Promoting my portfolio

I've just finished my portfolio and wondered how to submit it to all the major search engines. Can you point me in the right direction?
From: Simon

Dave Chaffey: Although you can submit a site through the Add URL pages of the major engines, this isn't going to help you get visibility and most SEOs would argue it's unnecessary. You need links for effectiveness, so call in some favours from friends and colleagues and reciprocate. Reciprocal links aren't 100 per cent bad; we've had the discussion here before about whether you can or should get links from clients. I'd recommend doing this in an ethical way – perhaps not from a run-of-site footer, but from the About page.

Facebook and privacy

There's been a lot in the news recently about how Facebook says it will keep hold of all the content people post on it, even if they delete their account. Does that mean if I post a photo on the site, Facebook owns copyright in it and could, for example, sell it for use in an advertising campaign? Could they even sue me for copyright infringement if I sold it in the same way?
From: Kelly White

Struan Robertson: Facebook never owns the copyright in your photos. It tweaked its terms following the recent controversy, but you always were the holder of copyright in your own photos, not Facebook. You can sell your photos elsewhere if you want to.

Facebook does enjoy a non-exclusive licence to use your content for commercial purposes for as long as you have an account, however. Following the tweak to the small print, it loses that licence after you remove your content or close your account. If you're not comfortable with giving Facebook any licence to use your content, I suggest you end your membership. Bear in mind, though, that users are the lifeblood of Facebook. The company is unlikely to do anything that would provoke an exodus of users.

The rules are likely to change again. At time of writing, Facebook is working on a new Statement of Rights and Responsibilities that will replace the current terms of use.

Disability discrimination

I know that businesses have to make their websites accessible to disabled people by law, but is there some kind of service that will assess whether websites are accessible or not?
From: Karl G

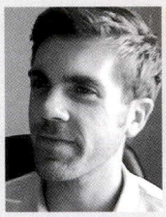
Struan Robertson: Automated tests such as www.tawdis.net are handy to indicate potential accessibility barriers. But don't rely on automated tests alone: they don't identify all issues. The best way to be sure that your site is accessible and usable for everyone is to get people, including those with disabilities, to test your site. Evidence of successful user testing by people with disabilities will be the strongest evidence of accessibility and usability – and of compliance with the Disability Discrimination Act. Don't make the fatal mistake of thinking that the law is actually all about WCAG.

For more info, see www.out-law.com/page-330. You'll find further help in PAS 78, which is to be replaced later this year by BS 8878. Many organisations can arrange disabled user testing for you, including the Shaw Trust, RNIB, Nomensa, Fortune Cookie, Web Credible and User Vision.

Nasty comments

If you type my company's name into Google, the first things that come up are nasty pieces written by anonymous people on blogs and forums. Is there any way I can remove these or move them down so they aren't the first few links in Google? I've heard of a service called removemyname.com

Focus on... The power of diversification



Profile

Name Mike Precious
Job Multimedia designer
Company Freelance
URL www.mikeprecious.com

To all web designers out there, when your livelihood depends on your ability to provide a creative product every day, it's crucial to expand your creative bandwidth – diversify yourself.

As a designer with a predominant foot in web design, I spend a lot of time designing sites, as well as browser-based UI (user interface) applications. I've discovered tremendous value in diversifying. The benefits? Clients appreciate custom-tailored solutions. Diversifying yields a wider breadth of creative competencies, which leads to a wider array of new business opportunities.

Many web designers have hung their hats on a centralised set of design parameters. While this can make project-to-project work more efficient, they're left with a series of websites in the portfolio looking similar – not a great long-term prospect for your portfolio, or your business sustainability.

But as a web designer, how do you diversify?

• Immerse yourself in creativity. Read industry publications. Check out CSS/Flash gallery sites. Network with industry peers. Keep a compendium of the best work you see and put it right on your computer's desktop so that it's in eyeshot at all times for quick reference.

• Understand the rules. Boundaries are extremely important in tempering solid, logical design. The first step to cultivating creativity is understanding the opportunities and restrictions of your media – CSS/XHTML, JS and AS3 for example – and how these languages respond in browsers.

• Hang your hat on a variety of design styles. There's an opportunity with every project to stretch yourself. Designing something truly proprietary to the client will take more out of you and require extra time, but the client will see the value.

You may still say: "But I'm stuck in a rut. New prospects come to my site's portfolio, cite work in it and want to apply many of the same attributes to their project."

The answer is: appease the client by saying you'll meet the same level of quality in design but that you want to research their organisation and strategic goals, and then create a design platform unique to their needs. Saying this upfront provides

/your experts

Design
Tom Hartshorn
Digital designer
Founding partner and creative director at London-based digital design studio Commonwealth.
thisiscommonwealth.com

Development
Tom Hughes-Croucher
Web developer
Tom is a standards-obsessed developer currently working for Yahoo in San Francisco.
kid666.com

Legal
Struan Robertson
Senior associate
Struan works at commercial law firm Pinsent Masons and is editor of OUT-LAW.com.
www.pinsentmasons.com

Marketing
Dave Chaffey
Web marketing consultant
Dave specialises in ecommerce and is a consultant, commentator, trainer and author.
www.davechaffey.com

Security
Con Mallon
Regional product marketing director
Con works for leading IT security company Symantec, covering Europe, the Middle East and Africa.
www.itsnotacon.co.uk

and was going to try it, but I'm very unsure and don't know much about this whole area.

What's the best way of removing nasty comments from the internet or making them appear way down in a natural search listing?
From: Chris D

Struan Robertson: If the comments are nasty and also untrue, they're probably defamatory. If so, tell the host. Identify the page and why it's defamatory and ask for its immediate removal. Most hosts in Europe will comply with such a request (because they become liable themselves if they don't, even if they didn't write the comments). In the US, it's more difficult to get defamatory comments taken down, though it's still worth trying. You can also ask search engines in Europe (including Google UK) to remove links to defamatory content.

SEO is another option, though its success will depend on many factors, not least the popularity of the pages that contain the nasty comments. If these pages carry a very low Google PageRank, your prospects of relegating them within search engine results are good – though it won't happen right away. If the nasty comments are true, this is probably your only ethical option.

Embrace change Try different top level navigation schemes, reversed interfaces and new typography

a more open-ended approach to design, so you're not painting yourself into a corner.

The results of diversifying will be seen in the wider abilities you'll exhibit and, as I've found from experience, there are monetary benefits to being a versatile and diversified designer.

> "Bear in mind that users are the lifeblood of Facebook. The company is unlikely to provoke a mass exodus of users" Struan Robertson

New developments

I find the whole subject of internet security confusing, as there seem to be new kinds of threats every five minutes. Is it important to be aware of every new trend? If I sign up with one of the big web security companies can't I just trust them to keep up with developments instead?
From: B Rose

Con Mallon: I think you need only concern yourself with the notion that you do need to keep yourself safe. Thereafter, it really is down to the security vendor you choose to keep you protected.

Yes, the threats evolve and change, but the leading security vendors can respond and head these off for you. So, at that level you need not be involved in details of keeping yourself safe. Now, if you're interested and want to know what your security product has detected or shielded you from, you can get data and statistics like this from the product itself. They all have some sort of reporting functionality built into them. All of the major security companies continually invest in R&D and in infrastructure to ensure they can both proactively and reactively respond to the development of new threats.

Firewall query

I'm starting out as a self-employed graphic designer and my set-up is quite simple – just one Mac and one PC, both equipped with Wi-Fi. I need to install a firewall; what sort of things should I be looking for?
From: Danny

Con Mallon: It's important that you do have a personal firewall of some sort in place on both systems. Now, both the Windows and Mac OS have a firewall capability built into them. These may meet your needs, but over and above this, there are standalone firewall solutions and the internet security packages from the main security vendors have a firewall contained within them.

What these separate solutions offer above and beyond what comes with the Windows or Mac OS comes down to enhanced levels of protection, more configurability and reporting. If these are important factors for you, then you should look for a standalone firewall or an internet security package.

Firewalls can be very complex and most of the solutions out there offer the ability to configure them to your exact needs and requirements. However, many now hide this complexity from the user.

Additionally, they have the ability to 'learn', based on how you use the computer and the applications that are used on your system, and then configure themselves accordingly. All of this saves you from having to get involved in configuring the firewall or having to respond to prompts or messages from the firewall itself.

Should I cater for large monitors?

I've built a very straightforward portfolio website to show around 200 images for an artist. The site is constructed using very simple HTML/CSS and I was wondering whether I should consider providing an option for certain viewers to be able to view it on larger monitors.

The design/content is so minimal that on a very large monitor I imagine the page content could look sparse. I obviously want the site to be appropriate for as wide an audience as possible and want the images to be large enough to get a good look at them without them bursting off the screen. However, a significant target audience, say galleries and other image makers, will probably have high-end kit to use for their browsing and will most likely have huge monitors. So, as this is the case, should I have the option for people to view the site on a large monitor?

If it's a good idea, I imagine that I could just duplicate the site and upsize all the images, and then change my CSS to make the text etc a bit bigger. I don't imagine a style-switcher is the way to go because that wouldn't deal with the sizes of the images. I'd really welcome any advice.
From: Martcol

Tom Hartshorn: You say 'a significant target audience', but really this is all guesswork on your part. Never >>

>> assume you know anything about the people who'll be browsing your clients' work. I would aim to design and build the site to be as accessible as possible to anyone who may want to view it.

It's certainly a possibility that people with large monitors may get some slim use out of a site optimised for their screens, but your time is probably much better spent working on one well designed, viewable-by-everyone website. Look to blogs such as www.boston.com/bigpicture that use large images well within an accessible screen size.

PNGs or GIFs?

Are PNG images the way to go? I still use GIFs for most things, but I read more and more about using PNG files. Is browser support at a level that means I can change to all PNG in my projects, or is it still a case of having to use hacks to make them work?

From: Dave Gid

Tom Hartshorn: GIFs are old news. It's all about the PNGs. There are a whole raft of reasons for this, but the long and short of it is that PNGs' compression is much better than that of GIFs (sometimes there's up to a 25 per cent difference in file size).

The PNG format is now backed by the web standards consortium – the W3C – and PNGs also have no limit to the number of colours they can contain, unlike GIFs, which are limited to a maximum of 256.

All good modern browsers support PNGs. The only time it's possible you might run into trouble with them is with alpha channels and older browsers such as IE6. I've also run into the occasional problem with matching colours (PNGs sitting next to JPEGs), but these can often be worked out quite quickly within your compression settings.

For more information on the subject and a list of current browsers that support the PNG format, check the W3C website (www.w3.org/QA/Tips/png-gif).

CSV problem

A friend of mine has a site that exports fields from a database into a CSV. The script runs the following line:

```
header ("Content-type: application/csv\nContent-Disposition: \"inline; filename=export.csv\"");
```

This worked well until they moved to a new host. Now, rather than the Save As box that will download the CSV file coming up, it just prints the data on the screen. Can you think of any reason why this might be happening?

From: Jarvis

Tom Hughes-Croucher: The line above that you've specified sets a number of HTTP headers that get sent to the client. It's possible that the previous host didn't apply all the rules. The two important ones here are: **Content-Disposition: inline** and **Content-type: application/csv**. **Content-Disposition** tells the browser what do to with this file – in this case you've set **inline**, which is what it's doing. This should be changed to **Content-Disposition: Attachment**. The other, **Content-Type**, sets the type of file, so when it's being downloaded the browser knows what to do with it.

Browser full screen

Okay, I know it is annoying to be forced to go full screen but basically I need to do it and ideally it has to be PROPER full screen without the need to press F11. It's not for a website, it's for a browser-based online application. But it will only be used internally, so it won't be annoying anyone!

I've looked all over the internet for something that makes the page go to full screen when the page loads but there is nothing at all that does it as far as I can find.

Do you know if this is possible? If not, it seems I'll be stuck with a full screen pop-up window. But even those seem to always have the address bar present, at least in Internet Explorer 7. Is this a security feature? Any advice would be gratefully received.

From: Scott

Tom Hughes-Croucher: There are Firefox plug-ins or options in Internet Explorer to use a completely full screen. However, as you say, for security reasons it's not possible to activate this from the browser. Depending on your app you could use Flash to provide full screen, provided the user activates it. You can see this in things like YouTube videos, which have a full screen option.

Town-specific pages

A lot of websites seem to be using a method of creating more localised results in the search engines by adding similar pages referencing a location, such as /local/web_design_in_croydon/. Is this frowned upon by Google?

From: MonkeyMeister

Dave Chaffey: 'Boilerplating' has become increasingly popular as companies such as car rental firms seek to reach local searchers. Visits to many car rental sites show that it can be successful, but you must take care to ensure each page is seen as sufficiently distinct. Google gives guidelines for avoiding duplicate content at http://bit.ly/dupe. It states: "Duplicate content on a site is not grounds for action on that site unless it

> "Never assume you know anything about the people who will be browsing your client's work" Tom Hartshorn

Top development tip

Which web language to learn?

I'm a graphic designer who wants to move into web development. I can write XHTML/CSS and want to create a Web 2.0 app that I've had in my head for a while. It's going to be a project to build this rather than pay for it to be developed.

I've been looking at ASP, PHP and Ruby on Rails. But I have no idea which language(s) will be the best for me to learn. I'm a quick learner who likes doing (I prefer tutorials as a way of learning to reading books). So lots of free tutorials on the net is a must for the first language I learn. What do you recommend?

From: Emma

Tom Hartshorn: Learning a new programming language from scratch is quite a challenge, let alone the goal of building a social network with what you've learnt. The pros and cons of programming languages is a much bigger conversation than we have space for here, but open source languages such as PHP and Ruby have very active developer communities and generally more useful developments than proprietary languages like Microsoft's ASP. I'd recommend you look for programming frameworks. These sit on top of a language and do a lot of the boring, monotonous tasks for you (or simplify them). Ruby on Rails is one such framework, but similar software exists for PHP, such as CodeIgniter and CakePHP – all of which are documented well and very approachable.

Speak the write language If you're teaching yourself, frameworks can help make the process simpler

appears that the intent of the duplicate content is to be deceptive and manipulate search engine results." In this case, if the services are available locally, it's not deceptive and is meeting a genuine user need. To show Google that each page is unique, it will require a distinct <title> tag, meta name="description" content and different headings and body copy. Google Webmaster tools will help you by identifying pages that have insufficient unique features such as title and description tags.

Ugly query strings in my CMS

I've built a content management system in asp (vbscript), which enables page.asp to return different content dependent upon querystring content. page.asp?page=1 will return the contents of page1.txt and page.asp?page=99 will return the contents of page99.txt and so on.

I've used the content linking component with a table of contents that looks something like:

page.asp This content
page.asp That Content
page.asp Other Content

with a loop counting through the table of contents rows to display them. The final html output then appears as follows:

```
<a href="page.asp?page=1">This Content</a>
<a href="page.asp?page=2">That Content</a>
<a href="page.asp?page=3">Other Content</a>
```

My problem is that any bookmarks or links from other websites are going to be to page.asp?page=1 type URLs. However, if I were to change the menu order, then the table of contents might become:

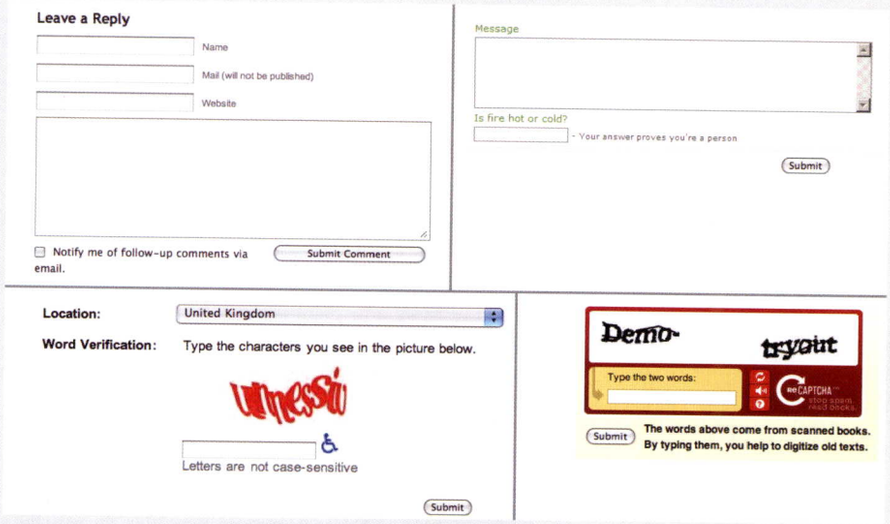
page.asp That Content
page.asp Other Content
page.asp This content

and the menu HTML might look like:

```
<a href="page.asp?page=1">That Content</a>
<a href="page.asp?page=2">Other Content</a>
<a href="page.asp?page=3">This Content</a>
```

meaning that a bookmark for 'This Content' would now lead the browser to 'That Content'. An outcome which, when it comes down to it, is quite rubbish. Having spoken to a friend with PHP experience, I'm led to believe a Windows alternative to .htaccess with mod_rewrite might be an avenue to pursue.Ideally when adding/editing the table of contents via my admin area, my script would open the .htaccess equivalent and define a rule that page.asp?page=1 would be masked by page.asp?This+Content. Then, perhaps I could make my final html output something like:

```
<a href="page.asp?This+Content">This Content</
a>
<a href="page.asp?That+Content">That Content</
a>
<a href="page.asp?Other+Content">Other
Content</a>
```



Access all areas

An effective way to combat spammers or a major accessibility problem? User experience guru **Alastair Campbell** examines CAPTCHAs

Almost every user hates CAPTCHAs, the squiggly letters you have to type in on forms. They're also a nightmare for accessibility. Unfortunately the excess of spam on the web makes life very hard for website owners, so a solution's needed.

The problem developers are trying to solve is preventing automated posting of spam by robots. The 'Completely Automated Public Turing test to tell Computers and Humans Apart' tries to stop non-humans passing. Unfortunately the same things that count against robots often cause problems for assistive technology.

A basic CAPTCHA has several distorted letters and/or numbers that you have to type in. But this most obviously is hard for the visually impaired. For those with mild to moderate impairment, distorted text is very tricky to read – I've got 20/20 vision and my rate is one in two.

People using a screen reader are out of luck, as adding an alt text to the image would defeat the point: a robot could read that as well. The obvious next step, then, is to add audio so you don't rely on sight. Many services have done so. But this too is difficult. As with images, the audio is intentionally distorted with background noise, making it hard to recognise numbers or letters.

The people creating CAPTCHAs are in an arms race with spammers, having to make them more and more distorted to prevent either Optical Character or Voice Recognition. It's got to the point where people without disability have to try several times, so for people with one, this may be an impassable barrier. If you're using a screen reader with a Braille reader, there really isn't a way past these CAPTCHAs. So what's a site to do?

The options depend on the situation, but there are two main interactions a site owner's likely to want to protect:

1. Non-registered users posting comments.
2. Creating an account.

Anonymous comments are a prime target for spammers, but there are ways of discerning this activity without creating barriers.

Services such as Akismet and Mollum will filter comments for you, checking their databases and marking spam. As soon as another service user marks something, everyone's protected.

Robots creating accounts is a slightly harder problem, as they may not give away their intentions early. But another relatively straight replacement for the image- or audio-based CAPTCHA is a simple logic puzzle. Mike Cherim's contact form is a good case of best practice for this approach: green-beast.com/qbcf-v3

The W3C lists several other alternatives (www.w3.org/TR/turingtest). However, for user accounts and communities, any type of CAPTCHA is likely to prove ineffective. There are humans who post spam and robots that show humans the CAPTCHA-images to solve for a price.

The best solutions seem to be community-based. For example, stackoverflow.com operates a karma system, where you have to post useful additions for karma points, and then you have more power. Metafilter uses a nominal $5 charge. The best methods longer-term will work because of people, not despite them. If you must use a CAPTCHA service, then use recaptcha.net, which uses the input to digitise books. ●

WWW. *Got a situation you can't make accessible? Send your details to netmag@futurenet.com.*

Profile

Alastair Campbell is director of user experience at digital agency Nomensa (www.nomensa.com). From a usability background, Alastair embraced technical web standards seven years ago.

Is this possible to do in a simple fashion with a Windows IIS server using plesk? Any thoughts would be much appreciated. Many thanks in advance for your help.
From: Andy McKenna

Tom Hughes-Croucher: There's an official alternative to Apache's ModReWrite for IIS (www.iis.net/extensions/URLRewrite). This system is arguably easier than ModReWrite because while it uses the same regular expression, it does so with a GUI interface to apply them.

Essentially you would make a rule like **^/content/([_0-9a-Z]+)** and rewrite it to **page.asp?{R:1}**. Rewrite rules aren't really suitable for matching something like **"That+Content"** to an ID of **"1"** unless you have a very small number of pages and can write individual rules.

Generally you'd want to have some part of your **page.asp** that looks up the pretty part of the original URL and translates it into something unique. This is why WordPress likes to use the format **/year/month/day/article-title-with-dashes** – because it's suitable as a unique key.

I'm out-ranking my clients

When I create sites, I build the prototypes etc on my server for clients to view and test. For one website that's now live on a client's server, the page on my server is listed before theirs in the search results – even though I've deleted it from my server.
From: Chan Beacham

Dave Chaffey: All solutions will have a time lag, but to prevent robots from the major search engines crawling a site pre-launch, a common approach is to create a robots.txt file in your server root containing:

```
User-agent: *
Disallow: /
```

You should use this for future projects or limit access through passwords. Alternatively, you could add **<meta name="robots" content="noindex,nofollow">** to the <head> section of each page. WordPress uses this method for new sites by default in its privacy settings, which can catch bloggers out!

To assist the client you're ranking above, you could create a 301 permanent redirect (if it's an Apache server), which maps pages on your domain to theirs. This will remove references to your server from the index.

Intellectual property rights

We're currently in the process of developing a low-cost web application for the freelance employment market. What can we do to secure our intellectual property rights and deter any potential copycats after our launch?
From: Richard Lingard

Struan Robertson: Very little. You may be able to get a patent for your app in the US, which will protect your idea, but it's almost impossible to get a patent for a web app in the UK. Your app will be protected by copyright, but that won't stop someone else using your idea; it just stops them taking your code or copying the design or the look and feel of the app. If your app is branded, consider getting trademark protection. At least that helps to stop someone taking advantage of your goodwill.

Similar domain names

I'm building a website for a small business. The business has been trading for 20 years and has been advertised in the local press and directories. Like many other businesses, its name was chosen so that it would appear first in the phone book, but this means that its name is similar to others. Several similarly named businesses exist in the same area and sell the same products. I'm concerned about any repercussions if I chose to purchase a domain name that was similar to these other businesses. For example, if A1thisproduct.co.uk is already trading, what would happen if I developed A1thisproductlite.co.uk?
From: Martin

Struan Robertson: In theory, your client has a right to use this domain name. I say that because it's traded under the name for 20 years and, I'm assuming, it's known locally, including to the rivals with similar names. I'm also assuming that there has been no dispute over the concurrent uses to date.

A rival business may still have a go at taking the name away from your client and even if your client wins that battle, the dispute could be expensive.

Of more concern, though, is the commercial value of a name that's so similar to a rival's. It could be confusing for customers when they're searching for your client because they may arrive at a rival's site instead. It may also send a negative message to potential customers: is the company with the second-best domain name the second-best business?

It may be worth trying to differentiate the businesses on the web through a more creative choice of domain name.

Surfing on the iPhone

I love accessing the web on my iPhone, but should I be worried about viruses? Are there particular sites or services that are vulnerable and is there a place to get iPhone security updates?
From: Michelle F

Con Mallon: The approach that Apple has taken with the iPhone is very much to restrict and lock down the software environment that surrounds it. With the first generation of iPhones, all the software that ran on the device was provided by Apple. The company has changed this approach with the second generation of iPhones, allowing other people

Focus on... Making a quick critique

Profile
Name Samantha Warren
Job Web designer
Company Viget Labs
URL www.viget.com
and www.badassideas.com

Giving concise website critiques can undoubtedly cultivate positive communication with clients and colleagues, but there's another benefit: we as designers can learn and grow as well.

Although conducting an in-depth analysis of a site's design can be a lengthy process, sticking to the specific criteria outlined here can help designers more efficiently arrive at a well-justified conclusion of a site's success.

1. Understand the site: Take time to audit the site in its entirety. Describe its successes and failures across three areas: user experience, visual design and technical architecture. Note which design patterns are present and how the navigation works to lead the user toward a defined conversion spot. Is the site mostly typographic or photographic? What colours are used? Don't forget to study the source code. A site's visual makeup is just as important as its technical build-out.

2. Analyse the design principles: Analyse how the designer used the elements and principles of visual and interaction design. How do things such as space, colour, texture, motion and sound (if applicable) affect its mood? How do they encourage, or discourage, user engagement? Take a look at the elements you described in the audit and translate how they interact with each other.

3. Reflect on the goals: After interpreting the site's purpose and its visual, interactive elements, determine if users can accomplish perceived goals. This is important, because a site can be very successful from a design perspective but fail to provide any value to its users. Some things to ask yourself here are: who is the audience and is this site appropriate for that demographic? Are there signs that the site is trustworthy and does the site provide an incentive for visitors to return?

4. Articulate actionable items: The final step requires that you synthesise everything from the previous steps across the aforementioned three criteria and generate actionable recommendations from those conclusions. Communicate valuable findings on both the perceived successes and failures and propose executable changes. Whenever possible, outline changes that could be

to develop applications, but these need to be vetted and approved by Apple, so there are still official checks on what's released. To date, thankfully, malware that's able to exploit the iPhone has been very limited and mostly 'proof of concept' – someone illustrating that it can be done, as opposed to real-time, real-life threats. However, as with any device or piece of software, there are no guarantees. The hackers and bad guys need not exploit the iPhone device itself; they need only exploit the user of the device. Often it's easier to come up with a plausible scam rather than to actually hack an operating system or application. So you still need to be vigilant about emails, messages and links that request, suggest or encourage you to do something on your iPhone.

Stolen laptop

I work on the move a lot as a salesman for an IT firm and have a recurring nightmare that my laptop gets lost or stolen. Apart from having a secure password into the operating system, is there anything else I can do to minimise the risks if the laptop falls into the wrong hands?

From: Patrick

Con Mallon: The most obvious thing you can do is to encrypt the data and information stored on the hard drive of your laptop. Some PC manufacturers offer laptops that come with a combination of hardware and software that enables you to encrypt the hard drive. If you're a Windows Vista Ultimate user, you can take advantage of the BitLocker drive encryption that comes with the operating system. There are also a number of standalone packages that you could look at, some free and some paid for, such as Aladdin, PGP, BestCrypt, Advanced File Lock and TrueCrypt. Their approaches and functionality vary, so you need to determine the level of encryption and security you feel will work for you and which you can work with. The quid pro quo with software-based encryption is that it may take longer for you to boot or access your PC because the drive has to be decrypted. However, this may well be a very small price to pay.

Remembering passwords

It seems like every day I join up to some new service on the web. The problem is, I have to remember an insane number of passwords. It seems like a dangerous idea to write them all down somewhere, so what's the solution?

From: Anthony Parker

Con Mallon: There are quite a few password managers on the market, including Roboform, Login King, Account Login and KeePass. They vary in functionality, but they all help by storing different passwords and logins. Each of them offers the ability to automatically log you into a site, which provides the convenience of not having to re-type logins and passwords. Some of them, such as Roboform, enable you to store other frequently used information and will automatically form-fill websites with name-and-address type information for added convenience. Password management functionality is also being added to browsers. Firefox, for example, has a password manager built in. Also, some security suites offer password management. Norton Internet Security uses Norton Identity Safe to store all of your important and valuable personal information. All these tools act as a digital vault of sorts, with one main or master password that protects the data contained therein. Security advice remains the same as usual with this master password: make sure it's complex and remember to change it on a regular basis. The real benefit is that you need only remember one password and then let the password manager take care of the rest for you.

> "A domain name that's similar to a rival's could be confusing for customers when they're searching" Struan Robertson

Free images

I'm looking for somewhere to get images and photos for web design. After a brief search, it looks like the only stuff out there for free (as opposed to royalty-free) is some pretty poor clip art. Am I expecting too much in hoping decent images would be free? Is it worth signing up with a stock image supplier such as Getty? They seem very expensive – I saw prices of $500 on some images! Any recommendations you have would be much appreciated.

From: CM

Tom Hartshorn: I think you're expecting too much. Maybe you've spent your whole life hanging out on the internet and don't remember a time when we used to pay for things. With stock photography, as with most things, you get what you pay for. There are places where you can get free stock imagery such as Stock.Xchng (www.sxc.hu), which I've really only used in desperate circumstances, but personally I think you should pay for any photography you use. If your wallet won't stretch to paying for the big repositories such as Getty, Tony Stone and Corbis, you can look to lower budget options. Big Stock Photo (bigstockphoto.com) and iStock photo (istockphoto.com) are both good choices. They're less expensive because their libraries are built from user-submitted photography and both have decent scalable payment solutions based on the resolution of the image you require.

If the project is non-commercial there's also the option of looking for images licensed under Creative Commons on Flickr. But make sure you read up on it first so you understand the ins and outs. Also, if you end up using someone's images, even if they do have the Creative Commons mark on them, it's good manners to ask their permission before you use them.

CSS question

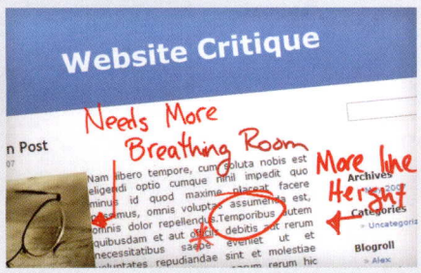
Another of those niggling problems. How can I get the left column (in this case it's the nav div), which has a background colour, to stretch all the way to the bottom when the layout expands?

From: Loxley

Tom Hartshorn: For this particular question, I'll refer you to my friend and cohort Alisdair Monk, who's a real CSS guru: "This can't be done in CSS alone, or at least not with any cross-browser integrity. The best way to achieve this is to use a JavaScript layout engine that will do all of the heavy lifting for you and allow you to concentrate on laying out your page how you want, while hiding the complexities of what's going on behind the scenes. I suggest using the jQuery JavaScript framework (jquery.com) with a plug-in called JLayout. The examples page (tr.im/ggec) has an example of 'automatic columns', which is the layout effect you want to achieve – right-click on **View source** to see the coding behind the demo."

Career advice

I've been working for a company for three years doing various development projects. My main role is creating and maintaining an internal reporting 'portal' web application that's written in ASP.NET. I feel like I don't know what else is out there in the industry and that doing VB.net and some ASP is going to limit what I can >>



Judgement day A concise website critique is a multi-faceted process that helps you grow as a designer

easy to implement through sweeping revisions that may not be realistic, but could have a substantial impact. Understanding the range of possibilities of site design in relation to the criteria outlined here will help you grow as a designer and consultant and help your clients and colleagues understand your reasoning. ●

do in terms of creativity. I'm worried that I'm going to end up just writing boring internal report portals all my life! I want to start doing websites that are interesting, full of design and creativity.

I have no formal training or qualifications in web design and learned everything from books and Google. I do have a BTEC (further education) qualification in graphics design and I've started studying towards an MCTS in web development (Microsoft Certified Technology Specialist).

Do employers require you to have design skills too, or do they employ designer and developers separately? Is the MCTS worth doing? Are there other skills I should concentrate on? Is ASP.NET the right language to stick with? Should I learn Flash too?

Should I be good at CSS and XHTML or is that the designer's job? Should I start making my own sites for a portfolio? How did all you guys get to the positions you are in now? Lots of questions, I know, but I feel I need to get a bit of perspective as to where I'm heading.

From: Jay Kay

Tom Hartshorn: There certainly are a lot of questions there, but let's start at the beginning. Thankfully, web design and development are both highly vocational skills and so most agencies will judge you on your portfolio of work, not the string of letters you have after your name.

Your personality (in small agencies this is particularly important), how you work in a team and how you approach and solve creative problems will all be taken into consideration when you apply for jobs in web design.

I've worked with a lot of designers and coders, some people who were both and some who eventually moved from one role to another. So the answer to the question 'What do I need to be good at?' isn't something that can be easily summed up in this small space. I'm of the opinion you should find out what you're best at and what you enjoy the most, then build on that – eventually you'll figure out a way to get paid for it.

What technology to use?

I'm just embarking on a spot of web development after four years off and need to update a friend's website. I'm unsure what the best practices are these days because the current site is almost entirely static HTML. I'd appreciate some guidance on which languages to use for the following site aspects I am planning: blog, news, portfolio and CMS. Would I be best off using PHP with a MySQL back-end database? What are the advantages and disadvantages of this over something like ASP.net? Where would you use JavaScript in a website – is this mainly for manipulating images?

From: Bisquite

Tom Hughes-Croucher: There are lots of possible solutions. Base your choices around your friend's existing host provider, because that's usually the hardest thing to change. WordPress is a great choice for a regular website or blog. It's pretty flexible and there are a zillion hosts that support it, including WordPress.com. Another great choice right now is Django, which uses Python. There are a number of places you can use this, including the excellent Google App Engine. Depending on the amount of customisation the site needs, I'd choose one of these. WordPress is great until you need to start modifying the application logic. Django has a bigger set-up cost and learning curve (if you haven't done much Python) but it's a joy to use for ongoing projects. While Rails is very trendy, I wouldn't advise it as much for websites – it's much better for web apps.

JavaScript vs jQuery

Does one need a good knowledge of JavaScript to learn jQuery? I just started to learn JavaScript but I've started to wonder if I should learn directly the syntax of jQuery to be able to take advantage of JavaScript. Do you think this is feasible?

From: aureli

Tom Hughes-Croucher: jQuery syntax, while powerful, is slightly different to standard JavaScript. jQuery is a great library and I'd recommend using it, but you should also make sure you understand the fundamentals. I recommend Doug Crockford's *JavaScript: The Good Parts* (video.yahoo.com/watch/630959/2974197 for the video; oreilly.com/catalog/9780596517748 for the book), which explains the bits of JavaScript that are worth learning. These are the fundamentals you need to know. Libraries such as jQuery can be the icing on the cake.

Black hat SEO

My site ranks well in the natural listings, but some competitor sites that rank higher seem to be cheating by repeating words that aren't seen by users because the text is the same colour as the background. Is this black hat SEO?

From: Tony

Dave Chaffey: What you describe is a basic form of black hat SEO. The use of hidden texts and links is explicitly against the Google Webmaster guidelines on practices to be avoided (bit.ly/hidden-links). You can report spamming activity via a spam report where hidden text is one of the categories, but don't expect an immediate result, since there are so many reports. Currently, Google is

> "Most agencies will judge you on your portfolio of work, not the string of letters you have after your name" Tom Hartshorn

Top video tip

Displaying videos on a website

I'm currently building a website for a client. They have a couple of videos in WMV format that they'd like displayed on their site. However, I don't want them to display in the default Windows Media Player window because to me, that just looks ugly. I'd much rather have the videos loading in a Flash player-style interface with basic controls (stop, play, pause, full screen etc), but I have no idea how to do this. Is it as simple as sticking in a Flash file and linking it to the video content, or do I need to create an individual Flash file from the videos themselves?

From: Benet

Tom Hughes-Croucher: There are a couple of things you need to do to host Flash video. The first is to get your video into the Flash video format (FLV). Then you need a video player for your page. The tools to encode FLV are included with Flash Studio. This is because part of the cost of Flash Studio pays for a licence fee that gives you the rights to encode video as FLV. At a stretch, there are some sites that will encode videos for you.

There are a number of free open source video players you can embed on your site, such as JW FLV Media Player (www.longtailvideo.com/players/jw-flv-player). You can either embed these directly into your page or use something such as SWFObject (code.google.com/p/swfobject) to embed it using JavaScript.

Play without pay There are lots of free open-source video players available to embed into your pages

particularly keen to encourage site owners to report paid links, as this is still the most effective, though unethical, method of getting ahead in the search rankings.

Pay per impression

Currently my site has ads from TradeDoubler and Google AdSense, which only generate revenue after a clickthrough. Do you know any advertising programmes that pay by impression?

From: A Patterson

Dave Chaffey: Pay per performance ads, such as the TradeDoubler affiliate ads and Google AdSense, are the most popular with advertisers because of the low wastage compared to the CPM (cost per thousand ads served) model. But there are CPM options available that tend to favour the advertiser more. You should talk to some of the many independent ad networks that offer CPM deals for their publishers. You can find a compilation of ad networks at bit.ly/adnetworks. There are some restrictions on types of site, content and traffic volumes.

File sharing

I'm building a file sharing site and was wondering about laws and other stuff I need to consider. If users upload software, movies or other media, am I responsible for going through them all and making sure they aren't copyrighted, or is it up to the creator to tell me? Will I get in trouble if users upload or will it be them, and is there anything else I need to consider?

From: Johnathan

Struan Robertson: I'll give you a rough idea of the main issues, but you'll need to seek legal advice on your plans. I'm assuming you're planning a file sharing site similar to YouTube, not a peer-to-peer model. If so, your risk will depend in part on the nature of the site's content. If it's for swapping movies or adult content, for instance, the risk is enormous. If it's for sharing open source software code, that's a far lower risk.

The best approach for most hosts is not to check files before they're made available to others, and to make it clear that you don't check them. You mustn't be seen to be 'authorising' copyright infringement, so take steps to minimise unlawful uploads using warnings and, if possible, filters. Also, to enjoy the legal protection that hosts enjoy, you must act fast to remove user-submitted content when you receive a complaint. Make it easy for people to complain.

Client threatens court

If a client signs a project completion document that states they're happy with a site, what sort of comeback do they have if they later decide it isn't working the way they want it to?

From: Jessica D

Struan Robertson: This depends on what the completion document says. It may not be the only relevant document and verbal promises can also be relevant. Disputes such as this tend to arise when obligations are unwritten or otherwise ambiguous. The

Access all areas

Our user experience guru **Alastair Campbell** explains why the end of skip links could be nigh

For years I've been recommending skip links, which enable people using a keyboard to jump to specific points on a page, but that could soon change. The latest ARIA spec outlines 'Landmark' roles, which enable developers to convey the intent of areas of each page.

For example, we may use this to provide a skip link to an accessible navigation:

```
...
<a href="#navigation">Skip to navigation
</a>
...
<div id="navigation">
<h2 class="hidden">Main menu</h2>
<ul>
<li><a href="home.html">Home</a></li>
...
```

When assistive technologies support ARIA, this can be represented by:

```
...
<div id="navigation" role="navigation">
<ul>
<li><a href="home.html">Home</a></li>
...
```

There's no need for skip links or hidden headings because the role of the div is programmatically identified. The simple addition of the role attribute enables technologies like screen readers to know what it is. Other landmarks defined so far are article (eg, the content of a forum post), banner (eg, a header area), complementary (eg, related links), content info (eg, footer links), main (the main content block) and search.

Those familiar with WCAG 1 are probably thinking, "But skip links are in the guidelines and that can't be valid HTML!" Well, WCAG 2 paves the way for this advance. Skip links aren't mentioned, but it asks that a "mechanism is available to bypass blocks of content". When ARIA is supported, this would be such a mechanism.

The 'Parsing' checkpoint requires well-formed HTML, not necessarily valid HTML. Of course, the easiest way to ensure that your HTML is well formed (has proper start and end tags) is to validate it. However, until the W3C validator or other specs are updated, accessibility should trump validity so, with care, don't let that stop you using ARIA. If you really feel the urge to validate, you can use Steve Faulkner's custom DocType: www.paciellogroup.com/blog/?p=107.

Why are these landmarks needed with HTML5 around the corner? Firstly, ARIA is likely to become a recommendation (standard) far more quickly. Secondly, the aim behind these different specifications is somewhat different.

It's likely HMTL5 will incorporate features that replace or overlap with ARIA. However, it's difficult to say how much and ARIA support is already starting to appear in browsers and other user agents. Currently, Jaws 10 is the only screen reader to support ARIA roles, but other assistive technologies are likely to follow. For more on ARIA, see www.netmag.co.uk/zine/home/ajax-and-accessibility-part-two. To test it, see addons.mozilla.org/en-US/firefox/addon/9108.

WWW. *Got a situation you can't make accessible? Send your details to netmag@futurenet.com.*

Profile

Alastair Campbell is director of user experience at digital agency Nomensa (www.nomensa.com). From a usability background, Alastair embraced technical web standards seven years ago.

remedies available to a client may be set out in project documents. If not, obvious remedies may be to withhold payment or sue for damages and recovery of sums paid previously. It's impossible to say for sure without knowing what was agreed in the first place.

Shopping safety

I've been looking at online supermarkets for elderly relatives who are worried about using cards on the net. I'm not convinced by the security statements I've read on some of these sites and I'm not sure whether in all conscience I can recommend them to my relatives.

From: Danni

Con Mallon: Whenever you go online to shop, bank or simply browse, there are some golden rules. When inputting personal or financial information, you should definitely look for the Secure Socket Layer encryption. To tell if a website is secure, look for the https:// and the padlock or key symbol in the bottom right-hand corner of the screen and also check the site's certificate. If you're ever in any doubt, don't give your personal or financial details.

Make sure that you have antiphishing software in place, so you really are logging on to the website you think you're on. You can now get internet security software suites that come with antiphishing, antispyware and identity protection. Identity protection is a very convenient way to securely manage your usernames and passwords. Look for one that offers automatic form-filling capabilities and one-click login to trusted sites as, that way, you ensure that nothing needs to be 'keyed' on your keyboard or appear on your PC screen, helping to defend you against any keyloggers or screen capturing malware stealing your information.

Internet cafe fears

I'm building what I hope will eventually become a commercial dating website. But for various complicated reasons, I'm having to do a lot of my work at internet cafes at the moment. Is there anything specific I should be doing to protect my code or design being stolen by someone who logs in to the same terminal when I'm not there?

From: Richard

Con Mallon: Internet cafes can be a great help and resource, but you're right that you need to take some precautions. You have to be careful not to leave traces of what you've been doing on the PC. If you use the cafe to send email or log in to websites, you should take care that the 'Remember my id on this computer' or similar option button isn't selected. You should also check whether the auto-complete option in the browser is off. This can be accessed in Internet Explorer through **Tools > Internet options > Content > Auto-complete** and in Firefox at **Tools > Options > Privacy > Password**.

Other interesting options to go through are the web history, download history, cookies, cache and tabs, all under **Tools > Options > Privacy** tab in Firefox (and also the **Clear Private Data** tab in the new versions of Firefox). If you're using Internet Explorer, go through Temporary Internet Files and History under **Tools > Internet options > General**.

Depending on the internet cafe, it may have already preconfigured the PC this way, but it's best to check. With Instant Messenger, make sure you exit the application at the end and don't just minimise it. Again, depending on which IM client you're using, go through the options and uncheck any option for 'Remember my ID on this computer'.

Ensure that the PC you're using has an antivirus package installed and that it's turned on and up to date. Check in the sys-tray for a security icon.

Importantly, make sure that the security program has some antispyware functionality. This will ensure that no one can electronically eavesdrop on what you're doing. Again, if you plug a USB drive into the PC, ensure that the security software does a scan to check that nothing else is transferred.

If you're using your own laptop in the cafe and connecting to a wireless LAN, verify with the staff of the cafe the exact name of the router to connect to. Ensure that the router itself is password-protected and using Wireless Encryption Protocol (WEP).

> "Google is keen for people to report paid links, as this is still the most effective way of getting ahead in rankings" Dave Chaffey

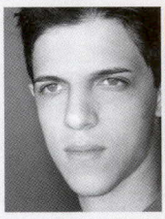
PHP refreshes

I want to detect whether the browser is refreshed or not using PHP and, if the browser is refreshed, what particular PHP code should execute. How do I go about this?

From: Naveen

Tom Hughes-Croucher: There are a couple of ways to achieve this. One of them would be to check the **$_SERVER['HTTP_REFER']** value and see if it matches the current page. This should work for most clients, but there

Focus on... Doing less



Profile

Name Vitor Lourenço
Job Senior interaction designer
Company Yahoo
URL www.vlourenco.com

"No matter how cool your interface is, less of it would be better." That quote comes from Alan Cooper, a pioneer of the modern computing era, and it struck me the very first moment I read it.

Resisting the temptation to try and look clever is a tough job for a designer, considering the endless possibilities we face while designing for the web. It's important to assume that a good interface is one that fades gracefully, enabling content to be in the very front. As a designer, you must always remember that, in most cases, users aren't there to appreciate your mad visual skills, but to accomplish a task that's important for them in some way.

Unfortunately most designers fail to resist the temptation of 'looking cool'. That's bad for the user experience, but at the same time creates endless opportunities for great designers to realign things simply and differentiate themselves by doing less.

How can one succeed by going simpler? Before you start designing anything, you need to know the purpose of your page and what you're trying to communicate. Decide what your message is, type it with a strong typeface, combined with a huge font size, and keep focused on what matters.

1. Emphasise high-quality content.
2. Shrink your navigation and focus on the content.
3. Group things effectively by using lots of white space between different components.
4. Remove unnecessary decoration and treat pure text as your user interface.
5. Be consistent and avoid reinventing the wheel.

There's a lot of room for designers to help people rediscover real communication. Clear, uncluttered designs can help reduce mistakes and contribute directly to people's lives. In addition, when it comes to web design, change must be easy and cheap. Simpler interfaces enable you to change on the go and move faster than the competition.

Of course, this isn't as easy as it sounds. Creating simple designs takes courage, vision and skill, but it's rewarding. Simplify everything to the point where it's obvious and your work will deliver a true competitive advantage – by doing less.

Top marketing tip

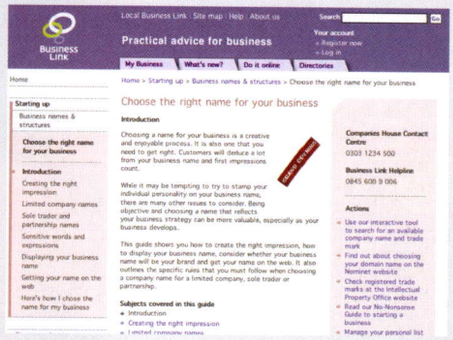
Domain names

I'm currently trying to come up with a distinctive combination of words for a domain name. Are there any words or phrases that I should avoid using for legal reasons? For instance, say I register monkeybananaboats.com and there's already a company called monkeybananaboats, could they sue me for copyright or trademark infringement?
From: Alfred

Struan Robertson: Even if a company shares your proposed name and has a trademark for it, that doesn't give them an automatic right to the domain name. But if you're in a similar line of work and they're established before you are, you'll generally struggle to keep it. And even having good rights to the name doesn't prevent someone trying to get it out of your possession.

Such disputes usually go before an arbitration body such as WIPO, which is generally cheaper and quicker than a court. For the domain name owner who faces such a claim, WIPO is better than court because you can defend your case by email and there are no damages to pay if you happen to lose. It's far better to find an original name if you can, however.

Put your proposed name into Google and you'll get an idea of who might object and any grounds they may have for doing so. Check this Business Link guidance on choosing a name: tinyurl.com/8lcuct.



Name game A company doesn't automatically have rights to a domain, even if its name is a registered trademark. But an original name is always better

are a few that may not send you the referrer information.

Another approach would be to set a cookie that you could use to determine if the visitor had refreshed. You might use a PHP session, but I'd advise using a custom cookie with the visited page in it. You can set the timeout on the cookie for 15 minutes to work out if it's a repeat visit or a refresh: **$page=$_SERVER['REQUEST_URI'];setcookie("refresh", $page, time()+900);**. Then you can check **if(isset($_COOKIE['refresh']) && $_COOKIE['refresh'] == $_SERVER['REQUEST_URI'])** to see if it's a refresh.

JavaScript DateTime

How do you get JavaScript to find the current date/time in the format yyyy-mm-dd hh:mm:ss? So far I've had to use all sorts of long-winded ways, such as using the getDays() or getSeconds() methods, for example, and sticking them all together to form a string in the right format. But even then I have to run extra checks that put a leading zero on any numbers that are between 0 and 9.

I've tried using the date() thing to get the current date/time, and using varDate.format('yyyy-mm-dd hh:mm:ss') (or whatever it is) to format a date variable, only to get errors. Is there an easy way to do it?
From: Dom

Tom Hughes-Croucher: The native JavaScript **date()** object doesn't have the formatting function that you might have been expecting. However, it's pretty easy to handroll. There are a couple of things to keep an eye on, such as the getYear, which returns two, three or four digits, depending on the browser and if the date was in the 20th century. You also need something to add those leading zeros to returned numbers for you. Try this script out – it's not too verbose.

```
d = new Date();
year = d.getYear();
if ((year+"").length < 4) {
  year += 1900;
}
//add items needing 2 digits to an array
oDate = Array();oDate.push(d.getMonth()+1);
//month returns 0-11 add one to normalize
oDate.push(d.getDate());
oDate.push(d.getHours());
oDate.push(d.getMinutes());
oDate.push(d.getSeconds());
for(i=0;i<oDate.length;i++) {
  //if length of item 1 add leading zero
  if((oDate[i] + "").length < 2) {
    oDate[i] = "0" + oDate[i];
  }
}
myDateString = year + "-" + oDate[0] + "-" +
oDate[1] + " " + oDate[2] + ":" + oDate[3] +
":" + oDate[4];
```

Drop-down menus in PHP

I need a little help with a filter form I'm creating. Basically, I have a band website and each band has a defined genre. I need to create a drop-down menu based upon the genres assigned to each band in the database; however, each genre can only appear in the list once. For example: Band 1 is Rock, Band 2 is Rap, Band 3 is Rock. I don't want Rock to appear twice in the list, so how do I make it only display unique entries?
From: FreheitOverture

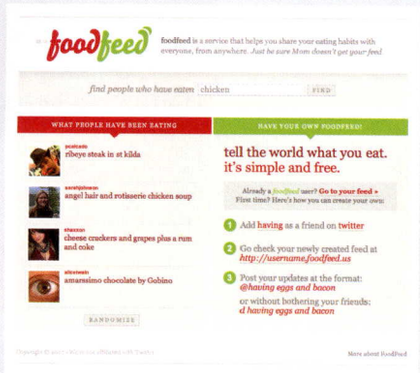
Tom Hughes-Croucher: PHP contains a function called **array_unique** (www.php.net/manual/en/function.array-unique.php), which you can use to remove duplicate entries from arrays. This way you could easily remove the duplicate genres from the array of items for the drop-down menu. I'd suggest you think about normalising your database and having a genres table. This would contain a list of genres and ids. Rather than listing the genre directly in the bands table, you'd instead list the id of the correct genre in the genre table and join the two tables together. This would mean you could list the genre table when you needed to know about genres without worrying about duplicate rows.

Source code links

I'm trying to find all of the links in source code on a website. Could you tell me the expression I'd need to put in my Regex to find these?
From: Dan T

Tom Hughes-Croucher: Something such as **/<a (.*?)href="([^"]*)"(.*?)>(.*?)/** would work, although it might not be bulletproof enough for all web pages. If the href isn't in double quotes, for example, this wouldn't be successful. You should look at the web pages you're using and consider employing a DOM parser instead, which would probably be a lot more robust.

WWW. Send your questions to netmag@futurenet.com or post them at forum.netmag.co.uk



Simplifood FoodFeed (foodfeed.us), a Twitter mashup that helps you track eating habits, features little decoration, treating the text itself as user interface

Inspiration every month

Each issue of *Computer Arts Projects* focuses on a different area of design, with practical advice on making the most of your creativity

Your special CD Web design tools and tutorial files

Your copy of The Advanced Guide to Web Design comes with a special CD containing all the files you need to follow the tutorials in the magazine, plus four fantastic pieces of software.

To make it easy for you to find what you need quickly, we've ordered the tutorial files into four menus that match the main categories in the magazine – CSS, Flash, Advanced Coding and Business.

Meanwhile, turn to the Full Apps menu and you'll find four fantastic full programs. Whether you're looking for a database administration tool or a domain management application, you should find something to please. There's plenty to choose from and discount offers too!

Becky Collier, new media editor
bcollier@futurenet.co.uk

DISC SUPPORT If you're having difficulties using the CD, please visit www.futurenet.co.uk/support

Full program > Navicat MySQL

A dependably consistent solution for database administration

Worth $129

Requires Windows or Mac

URL www.navicat.com

Navicat is a professional and dependably consistent solution for database administration that's efficient to use. Database management is made easy, cost effective and secure with this clever tool.

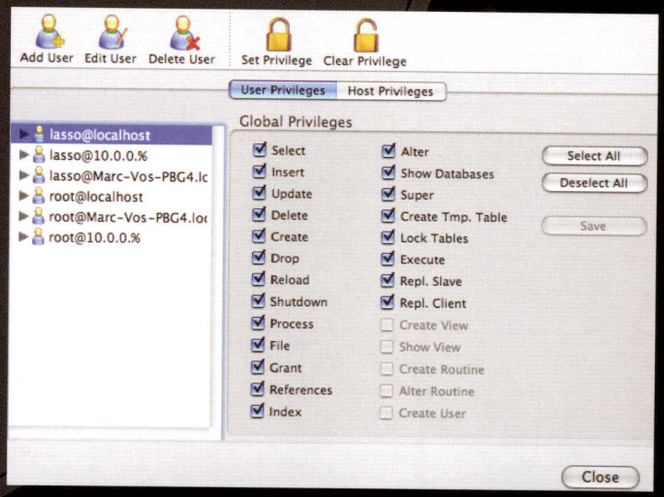
On the CD we've provided readers with access to a full, downloadable version of this able application for both PC and Mac OS X users, and all you have to do to take full advantage of this great offer is click the website button in the Full Software section on the disc. You can then choose to download either or even both versions of the program completely free of charge. Once you're up and running you'll find that Navicat is constructed with an intuitive GUI, which allows you to quickly begin creating, organising, accessing and sharing your valuable information in a safe and uncomplicated way. This smart tool is advanced enough to fulfil the needs of professional developers while still being very easy to learn for new users.

Navicat works with any MySQL version from 3.21 or higher and it supports most of the most recent MySQL features including Trigger, Stored Procedure, Function, Event, View, Manage User and more. Other features include support for MySQL 5.1's feature 'Scheduled Event', which permits the scheduling of any event defined in MySQL. The product offers 'Virtual Grouping', which also provides improved and enhanced categorisation for objects.

A noteworthy modification has been made to the 'Form View', which now displays a clearer display of the fieldname and its value with the focus on current record. 'Code Completion' has also been established in this version, resulting in SQL scripting that's quicker than ever.

Additionally, users can now open a profile directly onto their desktops by utilising the new 'Profile System', while the 'Enhanced Report Printing' feature permits printing of reports in several formats, including to PDF and HTML. It's even possible to send email from the application to notify users when scheduled tasks have concluded. Further improvements include 'Incremental Search' in 'Table View', which provides enhanced usability in Table Design as well as numerous improvements to most features to increase user-friendliness.

PremiumSoft also offers versions of Navicat for PostgreSQL and



Get organised Navicat's intuitive GUI enables you to quickly begin creating

Oracle for local or remote database administration and development. You'll find a trial version of Navicat for Oracle in the folder alongside the full MySQL version.

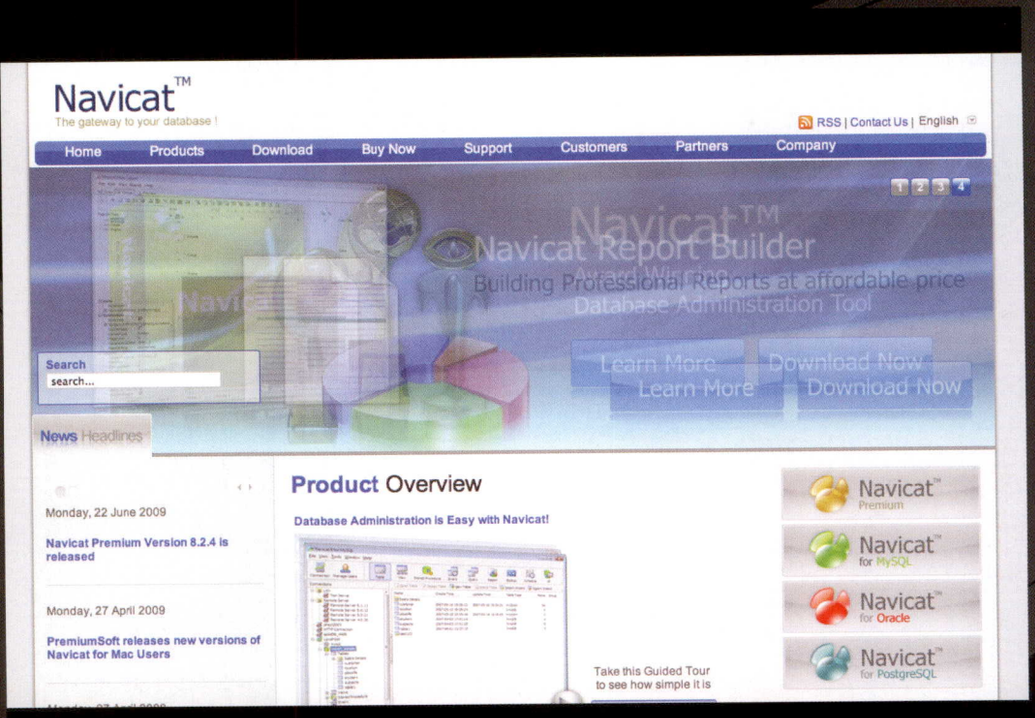
Navicat for Oracle enables you to create and edit databases as well as import and export data, build reports, create or run SQL queries and connect to multiple databases and remote Oracle in a really simple way. Like the MySQL version, it features an intuitive GUI and powerful visual tools including an Import/Export Wizard, a Visual Query Builder and a facility for Data/Structure Synchronisation.

Navicat for Oracle can connect to any Oracle Database version 8i and later and runs on both Windows and Mac OS X with remote connection capability.

Upgrade offer >

Navicat is offering readers of this magazine a huge 50 per cent off all Navicat products when they purchase online at: mysql.navicat.com/netmag_upgrade.html.

Please note that this special offer is only valid until 18 October 2009, so don't miss out!



Manage your data Navicat MySQL is purpose-built for simplifying database management and reducing administrative costs

Full program >

RAGE Domainer 1.8

A domain management tool that provides detailed statistics

Requires OS X

URL www.ragesw.com/products/domainer.html

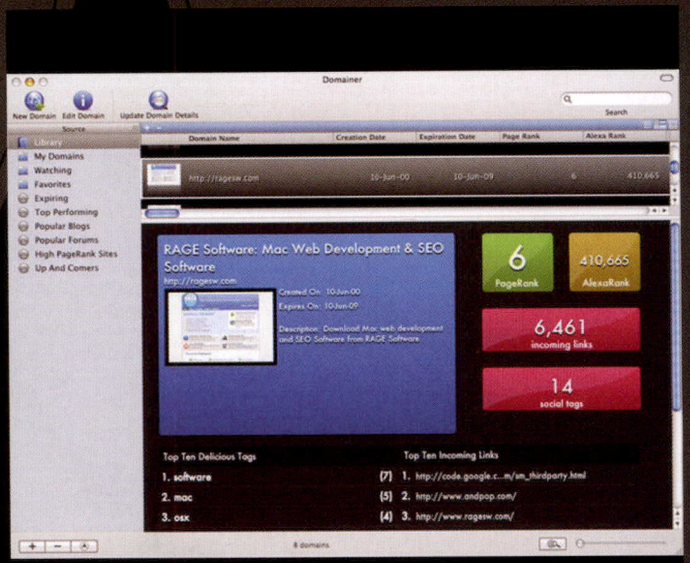
RAGE Software provides Mac users with top-notch applications with attractive interfaces that work in tune with their needs. Domainer 1.8 is its impressive domain management tool.

You can use it to keep track of your domains, simply by providing the app with your URLs. It quickly goes to work collecting detailed statistics, and the clean interface makes it easy for you to access other sites' info, too.

Google PageRankings, AlexaRankings, Incoming Links, Delicious Social Tags and popular Digg stories are all available. Bloggers can also use Domainer to access blog popularity and RSS subscriber information.

Statistics are compiled using leading websites' data, making it easy to see not just how popular your blog is, but also how popular everyone else's is too.

If you buy and sell domains often or simply want to keep track of your own website and how it's faring in the rankings, this really is a useful program to have in your web design toolkit.



Stats amazing RAGE Domainer quickly goes to work collecting detailed statistics and within moments you have a wealth of up-to-date information at your fingertips

Discount >

Readers can claim a 30 per cent discount when purchasing any RAGE Software product. Readers will need to purchase online at: **www.ragesw.com**

The following coupon code will need to be entered in the correct field at the time of purchase to claim the discount: **NETMAG09**

This great offer is only available until 1 October 2009, so get your skates on!

Full program >

FlickrShop

A full version of this latest Photoshop plug-in for Flickr

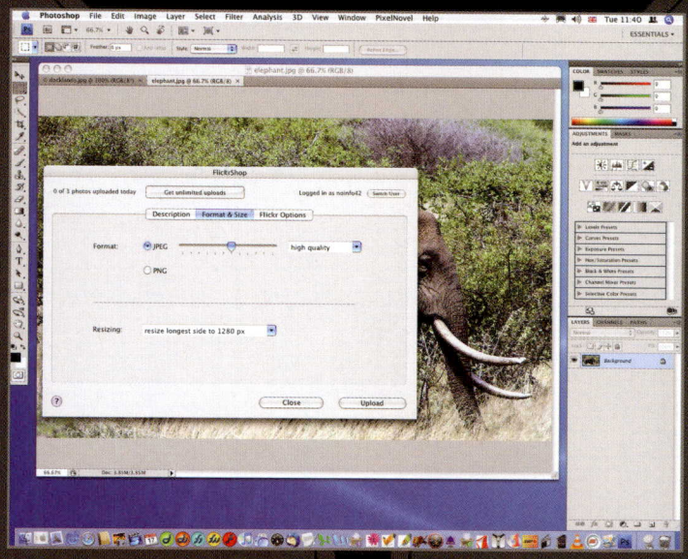
Requires Windows or OS X

URL http://pixelnovel.com/flickrshop

FlickrShop is a plug-in for uploading photos to Flickr directly from Photoshop. Again from PixelNovel, it's an invaluable service if you upload images to Flickr frequently or want to make changes to the images you've already uploaded.

Simply launch FlickrShop from within Photoshop, choose the image you want to upload, and then tailor the defined options to your requirements. Once you're happy with the image and the accompanying tags and descriptions, click the button and the images are instantly uploaded.

You can choose from several formats including PNG or JPEG. There's even an option that enables you to select the image quality. Image types, titles, descriptions and tags can be added to several sets at once if required, or you can create an entirely new set for each image collection. FlickrShop also enables you to select the visibility options for each image, so you can choose who sees what.



Picture this FlickrShop is a handy plug-in for uploading your images to the Flickr photo-sharing website directly from Photoshop

Registration >

To obtain the key and the full registration instructions, please visit PixelNovel online at: **www.pixelnovel.com/flickrshop/dotnet**.

Full program >

PixelNovel Timeline

A version control system for Photoshop

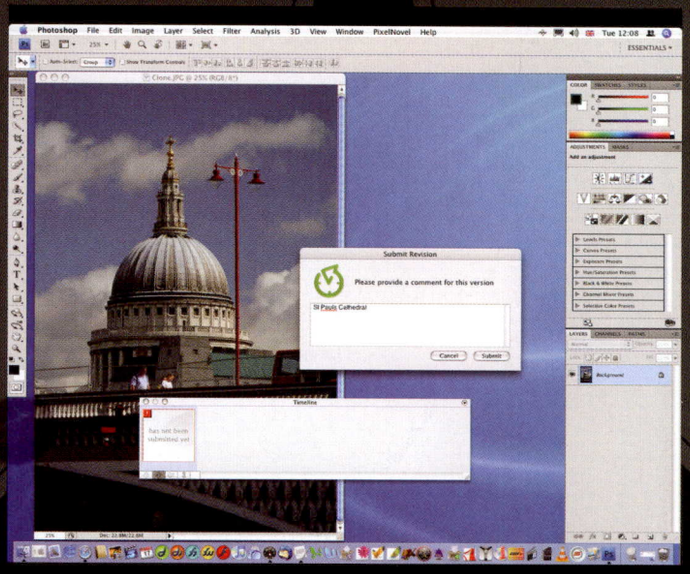
Requires Windows or OS X

URL pixelnovel.com/timeline

If you want to improve your workflow and maximise your productivity while maintaining complete control over the edits you make to your images, then Timeline, a fantastic version control system from PixelNovel, will be a valued addition to your toolkit.

This clever plug-in for Photoshop provides an effective version control system that enables you to easily store and manage multiple versions of the same file. Whenever you're ready to make a new save to an image file, you simply click a magic button in the Timeline palette in Photoshop, and your file is saved as a version on the PixelNovel server. You can even add useful comments explaining your changes.

After installation, a new panel is added to Photoshop's interface that displays small previews of all of your versions. Hover your mouse over the preview and the comments you created to accompany the image at the time of upload are revealed. To revert to a previous save, just click on the version preview and select and click the 'Get Version' button in the Timeline panel.



Take control Timeline provides an effective version control system that allows you to easily store and manage multiple versions of the same file

REGISTER >

PixelNovel has provided readers with a fully functioning 1GB storage account free for six months. To take advantage of this offer you need to first set up a user account at: **www.pixelnovel.com/signup**. Once the account is active, simply install the plug-in and follow the on-screen instructions.

Turn over for more CD content »

Complete listing
Tools and resources for the ultimate web designer

Full programs

Navicat for MySQL (PC & Mac)
Navicat is a professional and consistent solution for database administration that's efficient to use. Database management is made easy, cost effective and secure with this clever tool.

PixelNovel Flickrshop (PC & Mac)
FlickrShop is a plug-in for uploading photos to Flickr directly from Photoshop. An invaluable service if you upload images to Flickr frequently or want to make changes to the images you've already uploaded.

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Integrate images into grids
Open source version control
PNG texture overlays
Working with PNG
Create time-sensitive sites

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Build a 3D window
Build an XML carousel
Cut your workflow in half
Make scrolling animations
Optimise Flash movies
Video delivery with Flex
Create 3D with Papervision

Advanced coding
Build a site search system
Building dynamic forms
Customer rating system
Convert your site to mobile
Load page items with Ajax
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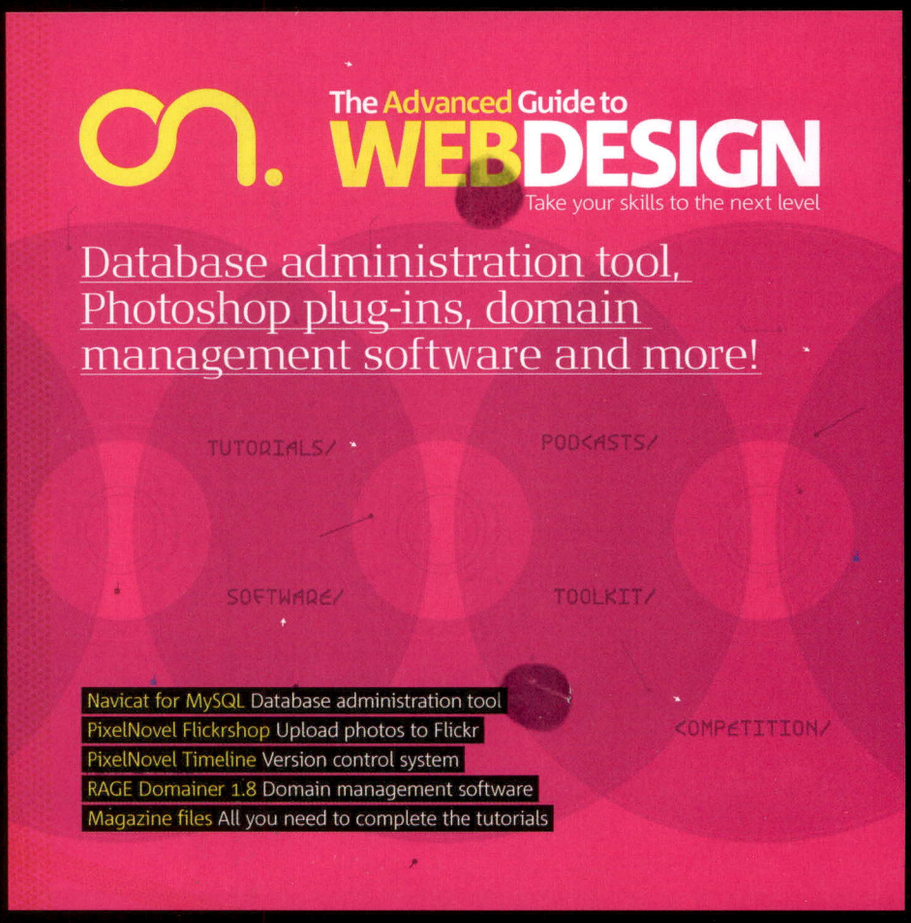

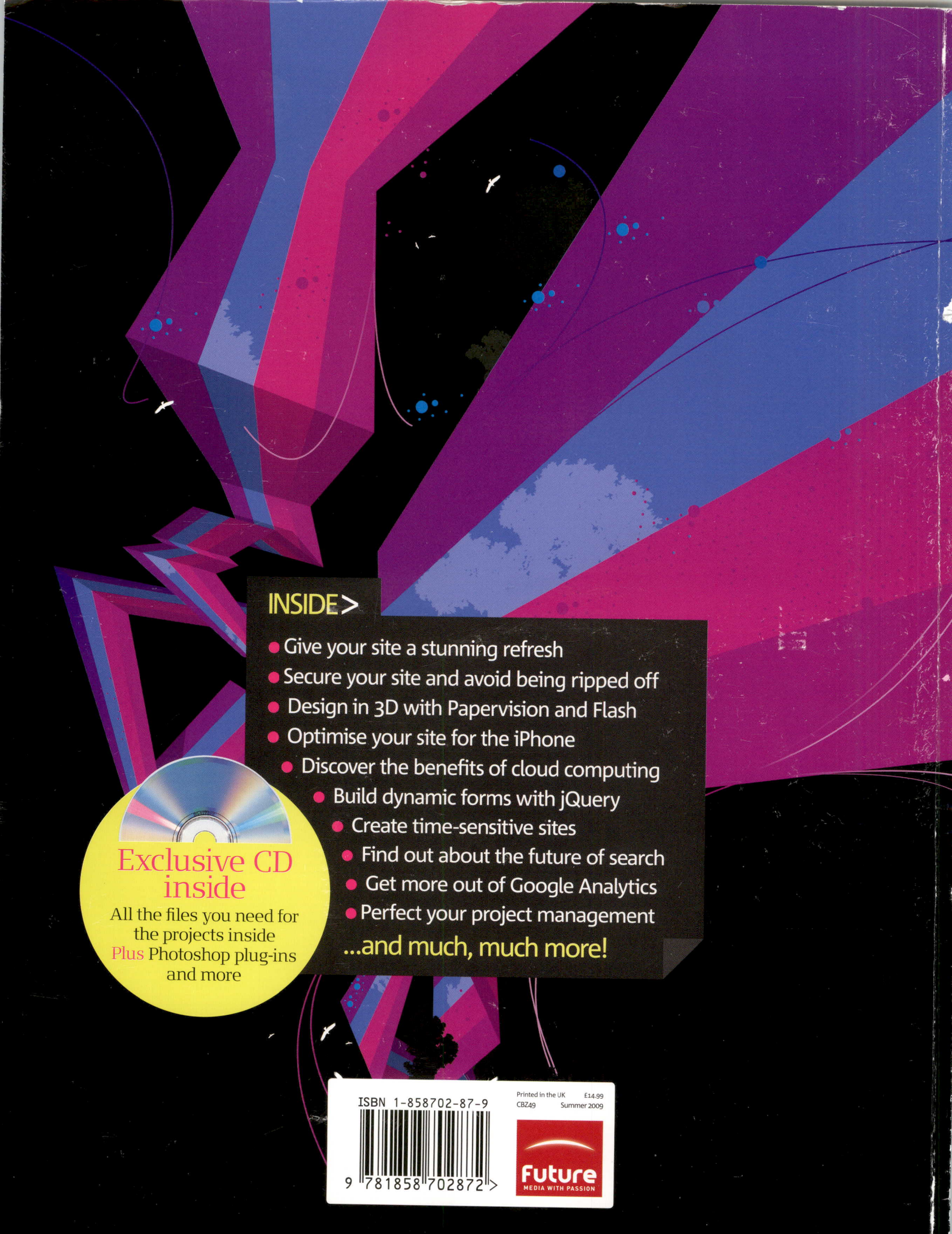

INSIDE>

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Plus Photoshop plug-ins and more

ISBN 1-858702-87-9

Printed in the UK £14.99
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